Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME IX.] NEW-YORK MARCH 25, 1854. [NUMBER 28.

THE SCIENTIFIC AMERICAN,
PUBLISHED WEEKLY,
At 128 Fulton street, N. Y. (Sun Buildings.)
BY MUNN & CO.
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Joints of Belting.

MESSRS. EDITORS—I have seen several articles lately, respecting the joints of endless belts for driving machinery. I have had considerable experience with machinery for the last thirty-five years, and have seen belts pieced in a variety of ways. I have seen them, when large, scarfed and then small bolts and nuts put through them with washers and plates under the heads and nuts. I have also seen rivets used instead of bolts; also rivets with plates next the leather, the whole length of the joint. I have great objections either to bolts or rivets, as they project, and are liable to catch and tear out, and I have had my hands cut with them a number of times. I have also seen some laced with sheepskin thongs, and others, after being scarfed, stitched with waxed ends with glue between them, which is a very good plan. But the best plan, in my opinion, for a permanent joint, is to scarf the ends as usual, then glue and bind them together with hand screws, or otherwise, until the glue is set, then apply as many shoemaker's pegs as are necessary, dipping each into glue before driving in. The pegs are then pared smooth, on both sides, and the joint made of an equal thickness with the rest of the belt. When the belt is exposed to a damp atmosphere, some water-proof and pliable cement would be preferable to use, but if not, I will warrant this joint to last as long as any other part of the belt. A MACHINIST.

Rochester, N. Y.

Apples at the South.

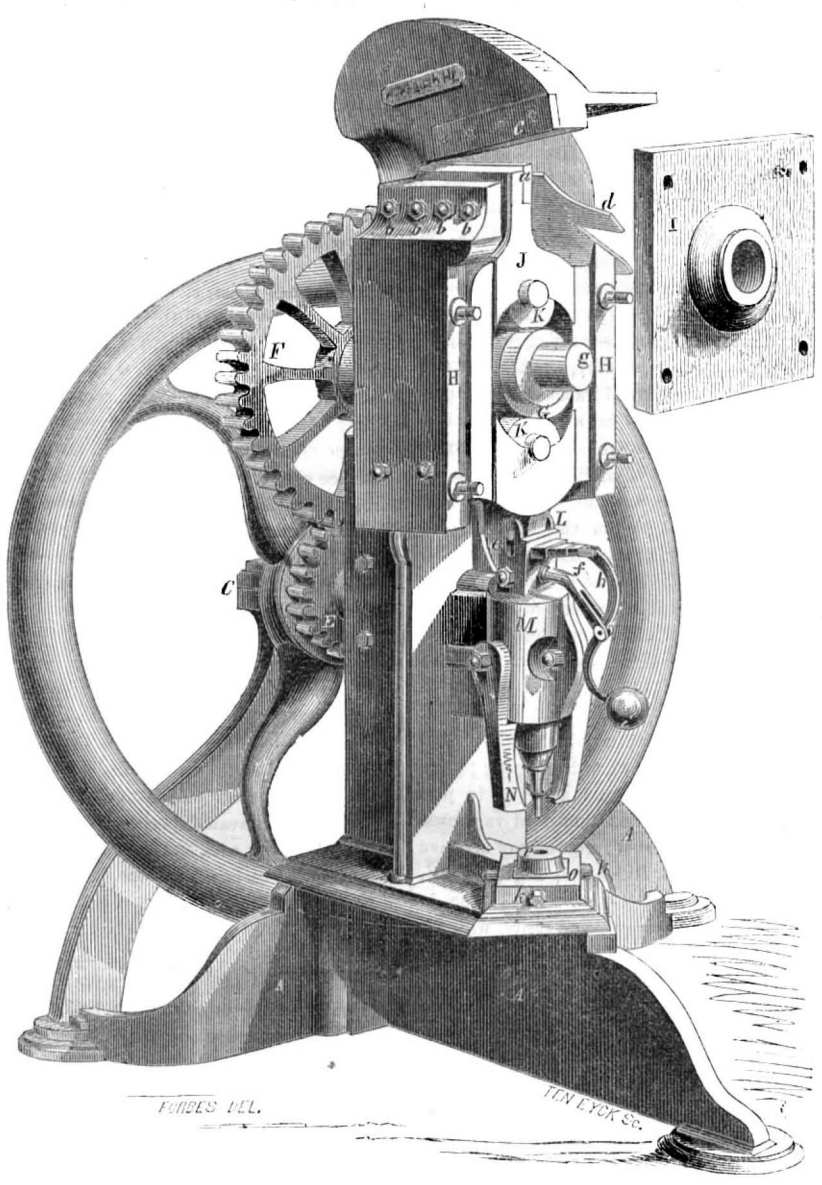
The cultivation of this refreshing, wholesome, palatable fruit, is no longer confined exclusively to our Northern States. Of late years it has been introduced into the Southern section of our country, and Georgia, beyond all her neighbors, is said to be entitled to the credit of raising many fine varieties of seedling apples. At a recent State fair held in Georgia, more than sixty varieties of native apples were exhibited, including some of the most desirable kinds. The Georgians claim that apples grow larger and fairer there than in New York State. The Cherokee Indians have been instrumental in producing a number of excellent seedling varieties there, as they were acquainted with no other means of propagation than by planting the seeds. Northern varieties grow as well at the South as at the North, but generally ripen too early for preserving or transporting to market. It is asserted that the justly vaunted Early Harvest, and Newtown Pippin will not compare in size, flavor or beauty with some varieties, of Georgia.

New Cart.

A French newspaper gives an account of a newly discovered plan of building carts and other vehicles. The new vehicle has four wheels, the foremost pair of which come about the middle of the horse's body; the weight is thrown on the axles, and the vehicle is so constructed that part of it covers the neck.

Designs for calicoes are obtained in France by means of the photographic process, which is reduced and transferred by means of a pantograph on the wood block, metal plate or cylinder.

PUNCHING AND SHEARING MACHINE.



The annexed engraving is a perspective view, with the front plate removed, for the purpose of showing the roller eccentric and yoke, of a machine for punching and shearing iron, for which a patent was granted to Ozias J. Davie and Thomas W. Stephens, of the City of Erie, Pa., on the 4th of last October. The nature of the invention consists in disconnecting the punch or its stock from the yoke by an automatic movement at each operation of the machine by means of a weight, spring, or their equivalents, acting in connection with a wedge or its equivalent, in which position the punch ceases to operate until the metal to be punched is properly in place, when, by a slight touch of the operator upon the rising of the punch, the connection between them is again made, and the punch is thrown into operation; by this means, allowing the machine to continue in motion, whilst the punch is only brought in to action when the sheet of metal is properly placed for it.

The base, A, and upright part of the frame, may be cast in one solid piece, and on the rear of this frame is attached a trussed pillow block, C, in such position as to form a proper bearing for one of the journals of the shaft which carries the fly wheel, the other journal of the shaft having its box or bearing on the frame. On the same shaft with the fly wheel is placed a spur gear, E, mashing with the cog wheel, F, on the shaft, *g*, of the eccentric, G, which shaft is also provided with suitable bearings, in which it may freely turn. In the front part of the machine the side plates, H, and the front plate, I, form a square chamber in which is placed and operated a yoke. J, in the top and bottom of which yoke are placed the friction and pressing rolls, K K, in suitable bearings, said rolls being provided with small journals to avoid friction. The eccentric, G, is placed between the friction rolls, the shafts or journals of all three standing perpendicularly one over the other, and as the eccentric, G, turns upon its bearings which are in the frame, it alternately raises and depresses the yoke by means of the rolls, K K, having their bearings in the yoke, and is always in contact with the surfaces of both rolls, so that the reciprocating movement of the yoke is without jar, being both raised and lowered by the eccentric, and consequently with the same power. On top of the yoke may be placed one of the blades, *a*, of a pair of shears made adjustable by the set screws, *b*, the other blade, *c*, of the pair being permanently fixed to the overhanging part of the top of the frame. A gauge for the shears may be applied in any well-known manner, and as they are common to other machines for a similar purpose may not be herein described. The pieces cut by the shears are thrown off by the guard plate, *d*. To the lower part of the yoke, J, is attached by a slip joint, *e*, the punch-stock, L, which carries the punches, and on said stock is arranged a curved arm, *f*, in which is hinged a curved lever, *h*, having on its lower end a ball or weight, *i*, and on its upper end a flat wedge-shaped key, which, when forced into the slip joint, *e*, between the yoke and the punch stock, completes the connection and throws the punch into operation. When the yoke is being raised up, the key becomes loosened (the weight or pressure of the yoke and rolls being removed from it), and by means of the weight, *i*, on the end of the curved lever, draws out said keys, when the punch will remain inoperative, whilst the machine continues to run until the operator has placed the sheet of metal to be operated upon in its proper position, when, by slightly raising the ball or weight, *j*, the key is again thrown in to form the working connection, and the punch then acts. This gives the operator sufficient time, without regard to the motion of the machine, to properly place his sheets or piece of metal to be operated upon. M is the punch stock guide, and N is an adjustable gauge for holding down the piece whilst the punch is being withdrawn: O is the die stock, and P the die therein, made adjustable to the punch by the set screws, *k*.

By this arrangement of rolls and eccentric in a yoke, we get immense power, which, when at its utmost, is in a line perpendicular over the punch; and as the rolls and eccentric are always in contact with each other, and the rolls in contact with the yoke, there is no sudden jar—the shears and punch being raised and depressed alternately by the eccentric, avoids the necessity of springs, straps or any other device for raising the punch or opening the shears.

The claim is for "disconnecting the punch stock from the machine automatically at each operation of the punch, by means of the weighted lever and key, or their equivalents, for the purpose of affording the operator time to place his sheets without regard to the motions of the machine, when, by a slight movement of the ball or lever upon the rising of the punch the connection can be again formed, as described."

There is one of these machines on exhibition at the Crystal Palace, and a medal was awarded to its exhibitors. More information respecting it may be obtained from Little, Kepler & Co., assignees and manufacturers, Erie, Pa.

Georgia Central Railroad.

WOOD AS FUEL.—The nineteenth report of the president, and the superintendent of the central railroad Georgia, presents a very favorable aspect of its condition and management, although the receipts for the past year do not amount to so much as those of 1852, but this is all fairly accounted for, there having been no less than a decrease in the freight of cotton amounting to 48,300 bales. This company intends to build their own cars after this, as they have found, they can do so for less than to import them from a great distance. There are 45 good engines belonging to this company; the total number of miles run by them last year was 509,169. The amount of wood used for fuel, was 8,831 cords—nearly a cord for every 58 miles—a great quantity truly. All railroads, must come to coal yet, and the sooner the better.

The First Large Steamboat in Paris.

A screw steamer of 700 tuns burden managed a short time since to find its way from Bordeaux up the Seine, and under the bridges, even to the quays of Paris.

It was constructed with a movable "centerboard," to be raised in the rivers, and let down when out at sea. The Emperor and his Minister of Marine visited and minutely inspected her. She draws but six feet of water with her full cargo aboard; is said to be a good sea boat; made a rapid voyage up the Seine, and, it is thought, may compete successfully with the railroad in the Bordeaux river trade.

The Material Fine Gloves are made of.

We have seen it stated in a great many of our cotemporaries, that monkey hunting is a regular branch of business in some parts of South America, for the simple purpose of obtaining their skins, which are sold for making fine gloves—surnamed "French kid."

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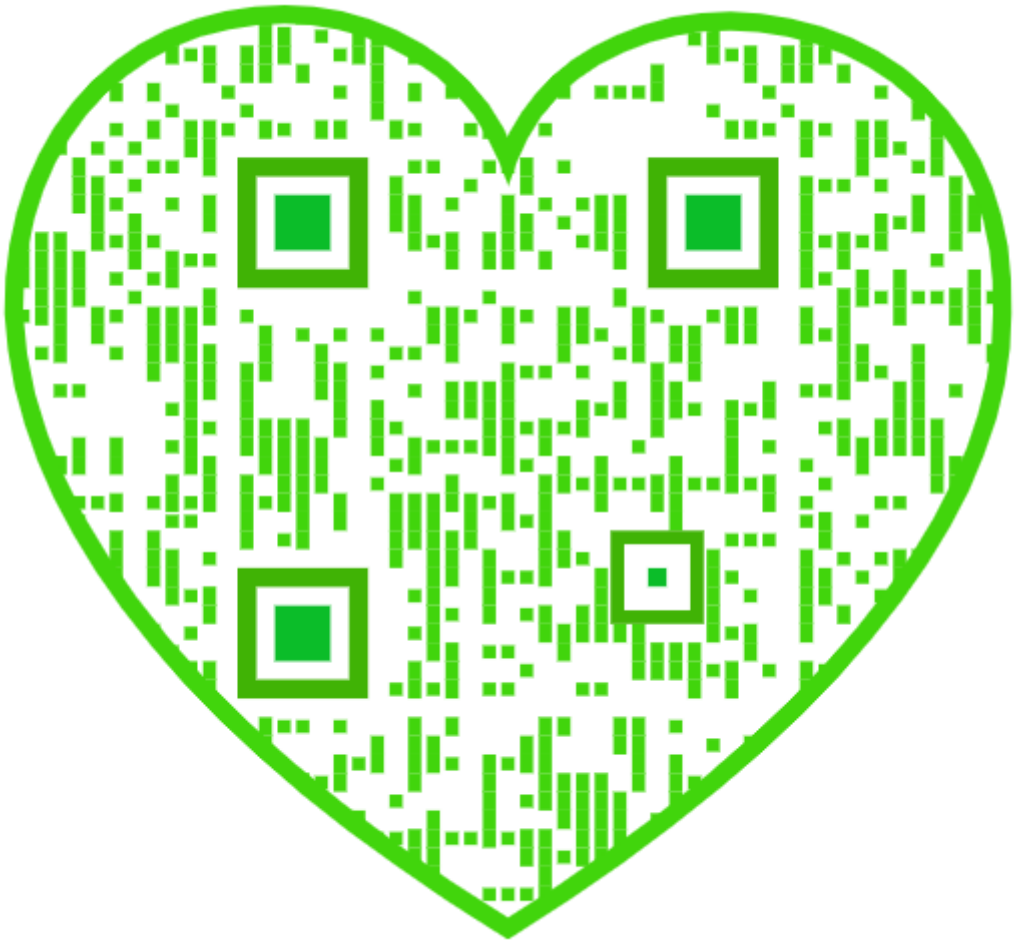

Foreign Correspondence.
Progress of Science, Invention, and Discovery.

London, March 4th, 1854.

American Paper.—The editor of the "London Atlas" speaks in glowing terms of some American wrapping paper which he has received from Col. Colt, of revolving fire arm fame. The English wrapping paper is in general half rotten, and tears with great ease. This is the reason why it is all made so thick—something like English *ben leather*, but instead of being as tough as good old English ben, it is as the Irish say of their old clothes—"tender as a chicken." The American wrapping paper is not half as thick as the British, but it is tougher and will stand more fatigue.

Gold in England.—There is much excitement at present among the dealers in mining stocks, and this feeling seems to be growing stronger and stronger. It relates to the general diffusion, or rather suffusion of gold among the lead and copper ores of Great Britain. A Mr. Calvert, who had lived some years in Australia, in making a geological survey of England, after his return, came to the conclusion that gold was much more abundant in Wales and some other parts of this Island than had been supposed. This opinion he formed from the geological characteristics of the country as compared with those of Australia. On a visit to some of the mineral districts, he actually was fortunate enough to pick up some pieces of gold, and this at once confirmed the truth of his previous speculations. Since the arrival of Mr. Berdan in this country, with his American grinding and amalgamating machine, the English gold fields have become still more important, for although it was generally admitted that Mr. Calvert had established the fact that gold was suffused through English copper and lead ores, still it was thought that it never could be extracted with profit. This question has apparently been settled as a public matter by Berdan's machine, still there is some controversy on the subject, and although such a man as Dr. Ansted has reported very favorably on the large yield of gold from some of the English ores, it is possible that he may have overlooked some important considerations in the experiments which were performed under his charge. My own opinion is, that some of the English ores reported to contain about two ounces of gold to the tun, will turn out to be far less rich in the genuine metal, and the end of all will be a fall in the *mining stocks*.

Geology and Coal.—A number of practical miners, some of them possessing great experience, and a considerable amount of geological knowledge, assert that there is coal to be found at a workable depth near London. Geological savans are skeptical of this, for if true, the science, as it relates to Britain must be revised; and that it will come to this there can be no doubt in my opinion, for facts have already come to light which must lead to new and very important results in the geology of the coal deposits. It has heretofore been asserted that there was no coal below the new red sandstone, hence when any shafts were sunk in search of coal, if they struck upon such a sandstone formation, then the affair was considered settled—no coal could be found below that, and the work of sinking deeper was given up in despair. A few years ago, however, coal was found in the south of England, by boring through the new red sandstone, and the discovery has enriched the person who had the temerity to amuse those who considered themselves good judges of such folly. If it turns out that there are coal beds beneath the London chalk deposits, France will have more reason to rejoice at the discovery than England, for the same formation extends to that country.

Condensing Chemical Gases in Chimneys.—A very great improvement has been effected in many of the chemical works here by condensing gases which used to escape out of their chimneys, and which destroyed vegetation for miles around their neighborhoods. The gases are now drawn into a horizontal flue which runs behind the furnaces and carries the gases to a square tower about 45 feet high, which has a partition running down through its middle filled with pieces of coke. Water is discharged with a force pump worked by a steam engine down one partition of the tower, and the gases being drawn up through the other partition to the top (which is covered) are there condensed, and trickle down with the water through the coke, and pass into a receiver, from which they are taken and treated in such a manner as to render them valuable chemical products. One chemical work after building a chimney 441 feet high to carry off the deleterious gases, just then discovered they did not require the chimney; that the refuse gases which it was built to carry away, could be condensed in a dwarf tower, and made into marketable products. Thus it is, improvements of the most simple character are the means of effecting wonderful reforms in every department of art and manufacture. Some of the English engineers have proposed horizontal chimneys for war vessels; the idea is a good one.

The Crystal Palace at Sydenham.—It is well known to the readers of the "Scientific American," that after the Crystal Palace was ordered to be removed from Hyde Park, in London, a joint stock company was formed, which bought the whole materials with the intention of removing them to Sydenham, a few miles from London, and re-erecting them there. The company is very wealthy, and the new will far surpass the old Crystal Palace in every particular; it will certainly be a wonder equal to some of those in fairy tales. The building is situated on the brow of a hill, from which on the one side London and the Thames are distinctly visible, and far in the distance, the ocean. The majestic proportions of the building rise from the sky line of a steep hill side, and far surpass in magnificence the structure of Hyde Park. The building, too, has gained two wings. Towers rise from the ends of the wings to a height of 230 feet. The nave is now 44 feet higher than the old one, and upwards of 120 feet wide. The pillars which support the galleries will be clothed with creeping plants, and it will be painted in such a way as to produce the effect of a vast tunnel of rainbows. An immense collection of rare works of art have been made by Owen Jones, and Digby Wyatt, who were employed to traverse Europe in search of articles of beauty and rarity, with authority to purchase to the amount of $200,000. They returned laden with the richest spoils of European art. All the richest and most beautiful gems of statuary, sculpture, architecture, and painting, are represented.

The nave is to be a splendid conservatory. Flower beds, green banks, trees and shrubs will entwine their green leaves and lovely crests amid iron pillars and flowing fountains, the water of which is raised from an artesian well 500 feet in depth, and is then forced by means of an engine into the great reservoir on the Sydenham side of the Palace, which is 150 feet square, and 20 feet deep. Here another engine drives it into the reservoirs on the summits of the towers, 230 feet in hight. Such will be the circulating system of the garden that 2,000 tons of water may be forced through its entire frame every minute.

This new Crystal Palace will cost ten times as much as the one in New York, namely, £1,000,000, about $5,000,000, before it is finished, thus showing the vast amount of capital in this country. The enterprise is one of the most original and noble ever conceived.

Perhaps the grandest idea connected with it, apart from the building itself, is the construction of a huge organ, of such power that its volume of sound will fill the immense pile. The Directors of the Palace have consulted a committee of gentlemen well skilled in the theory of music and sound, who have reported on the subject. The dimensions of an organ capable of sending its thrilling tones through the whole structure, will be 180 feet wide, 140 feet high, and 50 feet long. The internal construction will be like that of a house in stories, for the convenient support of sound boards and pipes. The feeder of the bellows will be worked by steam, and this will certainly be a new branch of business for that useful friend of man—the steam engine. Two of the pipes of the organ will be 64 feet long, and will resemble huge chimneys, but they will be of beautiful construction, and form an ornamental frontage to the instrument. This magnificent organ will cost £25,000 pounds, (about $125,000,) I do not know whether such an organ will be built because proposed, but as the Directors have done so much on such a grand scale, it is possible they will not be behind in the music line.

Inventions.—Day & Newell's Lock, known as "Hobb's Lock" in this place, has been picked, so I am creditably informed; well, it took a long time for those here to learn to do it.

The American Reaping machines are the favorites here; they are more simple and less liable to break and wear out than Bell's Reaper. A number of American agricultural machines brought over here have met with much favor owing to their neat and compact make; they are superior to the English in this respect, but it must be acknowledged that the latter have greatly improved since the World's Fair in 1851. England gained a great advantage by that Exhibition.

Remembering the character of the "Scientific American," (*nultum in parvo*) I add no more at present. Yours, R. B.

On a Chemical Cause of Change in the Composition of Rocks.

The following is an abstract of a paper read before the British Association, by Prof. Johnston. The first example of a chemically altered rock adduced by the Professor, was the rotten-stone of Derbyshire,—a light and porous substance used chiefly for polishing metals, and stated in Philips' "Mineralogy" to be composed of silica, alumina, and carbon. It is obtained from a ridge covered with "drift" 10 or 20 feet thick, consisting of brown clay, with manes of black marble, chert and rotten-stone. The rotten-stone is so soft whilst in the soil that the spade goes through it readily, but it hardens on exposure; the holes from which it is dug are sometimes only 2 feet deep, at others from 6 to 8 feet. On examining a series of specimens, Prof. Johnston found that whilst some were homogeneous, others had a nucleus of black marble; he then treated specimens of the black marble with weak acid, and found that on the removal of the carbonate of lime, there remained from 15 to 20 per cent. of a silicious substance perfectly like the natural rotten-stone.—He concluded that there existed in the soil some acid which penetrated it and dissolved out the calcareous matter of the rocks below. The agent in this case might be the carbonic acid of the air, brought down by rain; but there were instances not capable of explanation by this agency alone, and attributable to other acids, which are produced under certain conditions and exercise a much wider influence. The bottoms of peat bogs present very strong evidence of the action of acids, the stone and clay are bleached and corroded, only silicious and colorless materials being left, The source of the acid is here the same as in the former instance; the vegetable matter growing on the surface produces in its decay acid substances which exert a chemical action on the subsoil, and escape by subteranean outlets, carrying away the materials dissolved in their progress. Another instance was afforded by the mineral pigotite, formed in the caves of Cornwall by water dripping from the roof: this water contains a peculiar organic acid, derived from the soil of the moors, which dissolves the alumina of the granite and combines with it. The organic acids are very numerous and different in composition, but, agree in producing chemical action upon rocks. They are produced over the entire surface of the earth, especially over uncultivated tracts, and are the means provided by nature to dissolve the mineral food of plants; they are also amongst the chief causes of the exhaustion of soils. The author then alluded to Prof. Way's examination of some of the green-sand strata of Surrey, known as fire-stone,—a light and porous rock, containing silica in a soluble state. It was well known that common sandstone, quartz, or rock crystal were not acted upon by potash or soda at ordinary temperatures; but of the firestone 30 per cent, and sometimes 50 or 70 per cent., may be dissolved. In all such cases the silica must have been originally in a state of chemical combination with lime, alumina, or something else, which has been subsequently removed. The silica in the rotten-stone was soluble, but he had never met with instances of black marble in a bedded state converted into rotten-stone. He believed, however, that a similar cause, operating over a wide area, and during a long period, had produced the altered condition of the firestone.—Prof. Johnston then alluded to the nodules of phosphate of lime in the green-sand and crag, and suggested that the phosphorus had been derived from animal remains in higher strata, dissolved out by acids and re-deposited at a lower level. The last example was the fire-clay of the coal measures, a stratum almost universally found beneath beds of coal. It differs from the other clays both in color and composition, being whiter and containing less of those substances which acid bodies could dissolve, viz., the earthly basis, which would render the clay fusible in fire; the condition of the fire-clay might be accounted for by the action of acids developed during the production of the vegetable matter now forming coal.

Reaping Machines---Original American Inventor.

In your paper of the 25th inst., I notice the claims of priority in the invention of grain reapers, by the Rev. P. Bell, of England. Having noticed such claims repeatedly, I have concluded to speak for myself, and briefly tell my own experiments and the results in horse power grain reapers. For with me the thing was original, I neither copied from Englishmen or Americans. I was born and reared on a farm near Union Village, Washington Co., N. Y. While yet a boy in 1824, I tried my first experiments with shears, the blades of which were so curved as to present nearly the same angles of edge from heel to point while cutting. But still the shears pressed the grain forward in cutting. In 1825 I tried further experiments with a reel and sickle edge, but returned to the vibrating edges. In 1826 I completed my experiments with the reel and vibrating cutters. And I also tried experiments with vibrating bearded rods in order to gather the grain on the platform for binding and dumping the bundles. I hoped to be able to bind on the machine, and I still believe it will be done to advantage. My machine extended into the grain to the right, and it was mounted on the hind wheels of my father's lumber wagon. The wheels being large and the gearing so simple, that in 1826 a single horse drew my brother and self on the machine and cut rye at the rate of one acre per hour. The wise ones of the east viewed it as original with me, and derided me alone by calling it Harvey's Folly, but when they become astonished at its operation, they gave it the new name of Harvey's Great Amazement.

I have antique drawings before me of the said machine, which I preserved, hoping to secure some profit by taking out letters patent and by manufacturing, if I ever became able to do so. My father refused to help me in this, for he said the Patent Laws were only calculated to draw men into ruinous law suits. I tried to get help from others, but all refused to help me when they learned my father's views of the Patent Laws. In support of the main facts above, I presume twenty living witnesses can still be found. Yours, &c.,

Harvey H. May,

Galesburg, Ill., Feb. 27, 1854.

[The father of our correspondent labored under a very mistaken idea of our patent laws. Had he encouraged his son and secured a patent, it would have made both him and his family wealthy. Those who patented their reapers afterwards, have become rich. We are sorry to say that there are many men who have now the same erroneous opinions respecting our Patent Laws; hence they dig and sow, while others come after them and reap the fruit of their labors. No man who invents any useful improvement should neglect to secure it by patent. Not a week passes over our heads but some inventor expresses his regret for neglecting to patent some invention for which another secured a patent afterwards and made a fortune by so doing.—[Ed.

Gold Coinage of England.

There were coined at the English Mint, in 1853, 10,597,993 sovereigns, 2,708,796 half sovereigns—nearly $60,000,000.

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[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MARCH 14, 1854.

ROTARY CULTIVATORS—G. B. Field, of St. Louis, Mo.: I claim the construction of the rotary cultivating cylinder, made of cutting plates or spades, and interposed pushing or clearing boards for removing the earth, as described.

I claim the arrangement of the shield plates on the shaft, for the purposes set forth.

I claim the arrangement of the rotary harrow, sustained above the ground and in the rear of the cultivating cylinder for breaking and pulverizing the falling earth.

SAW SET—Oliver Lesley, of Attica, Ind.: I claim the arrangement of the triangular gauge with the swage, upon the stock, for the purpose of adjusting the gauge relatively to the nick or recess in the swage, as set forth.

EXCLUDING DUST FROM RAILROAD CARS—Orrin Newton & J. A. Crever, of Pittsburgh, Pa.: We claim the combination of the bellows and water cistern connected with each other and with the cars by pipes, for the purpose of ventilating railroad cars, constructed and operating as described.

DAMPING PRINTING PAPER—Andrew Overend, of Philadelphia, Pa.: I claim, first, the self-acting feed board arranged and operating as described.

Second, the arrangement and combination of the upper and lower felted rollers, for the purpose of saturating the upper roller in the intervals between the passage of the paper, as described.

Third, the projections for the purpose of breaking the bead as the paper enters, as described.

Fourth, the combination of the wetting cylinders and fly, as described.

FORM OF SCYTHES—J. W. Robinson, of Kirkland, N. Y. I claim the form which is given to the back and web of the scythe, as described, whether the web starts from the center of the back, or elsewhere except from the edge.

MOLD BOARDS OF PLOWS—E. M. Bard, of Philadelphia, Pa.: I do not claim to be the inventor of the combination of cutters or rakes with cultivators or plows, for enabling the latter to perform two functions at the same time.

I claim securing the cutters in openings formed in the mold board at the points, and in the inclined positions outward and backward, represented so as to enable the lower forward cutters to cut and loosen the soil preparatory to its being overturned, and the other cutters to more thoroughly pulverize it as the body of earth is thrown over, and the cutters from their peculiar inclined position, to disengage themselves from weeds and other obstacles, as they pass the same, the several parts being as described.

MOLDS FOR MAKING PRINTING BLOCKS—James Berry, of Roxbury, Mass.: It is proposed to extend this invention to the production of cylinders as well as blocks, and also to set the types for the molds by machinery, from which a great saving of labor will result, but this forms no part of my invention. Neither do I claim making blocks for printing by casting them into suitably prepared molds. Nor do I claim making blocks for printing woolen or other fabrics, by setting up movable types, and thus producing the requisite figures to be subsequently printed from.

But I claim forming the molds in which to cast printing blocks of types or prisms, as described, and for the purpose, set forth, by which I am enabled to produce a great variety of patterns at a very small cost, and in a short space of time.

MACHINES FOR MAKING SHOVEL HANDLES—R. D. Bartlett, of Bangor, Me.: I claim the combination and arrangement of the bed, the rotary holder, one or more vertical movable cutters, and one or more stationary cutters, as made to operate together and form the D or head part of the shovel handle, as specified.

And I claim the combination of the curved knife and the arc knife, so applied together as not only to allow them to be separated for the purpose of being ground, but to enable them to cut out the opening of the shovel handle, as specified.

I claim also the combination applied to the shaft of the rotary holder and gear wheel, for the purpose of operating the holder, as specified, the said combination consisting of the cam blocks, the arm, the spring bolt, its cam, and the two studs, the whole constructed and operated together, as specified.

SEED PLANTERS—Chas. W. Billings, of South Deerfield, Mass.: I claim linking or otherwise equivalently attaching the pulverizing gauges to the draught bar, in such a manner that the gauges are raised or lowered to regulate the depth of furrow to be cut, by elevating or depressing the draught bar to its proper pitch or hight for the draught at a given depth of furrow, and whereby the draught bar and gauges are simultaneously raised or lowered, as set forth.

I also claim the combination and arrangement of the vibrating seed segment slides geared together by cogs or teeth on their peripheries and operating in unison, as set forth.

I also claim the manner of pivoting or jointing the vibrating segments at their centers of motion, by constructing the jointing pin with projecting ears or lips, and forming the joint hole of a key-hole shape, as described.

I further claim, in combination with seed distributing slides, the employment of the double-acting spring clearing slides, arranged so as to be capable of lateral movement in either direction, and made self-adjusting to their original position, as specified.

[See notice of this invention on page 348, Vol. 7.]

FAUCETS FOR MEASURING LIQUIDS—Joshua Cross, of New London, Ohio: I claim the construction and arrangement of a measuring vessel and the valve of a faucet, as described,

TAPERING NOZZLES TO THE EXHAUST PIPES OF LOCOMOTIVES—Frederick Espenschade, of Mifflintown, Pa.: I am aware that various contrivances have been combined with the usual immovable conical nozzle of the waste steam pipe of locomotives, for the purpose of enabling the engineer to vary the draught in the furnace; and therefore I wish it to be understood that I limit my claim to the employment of movable tapering nozzles of various sized orifices, so arranged that either of the said nozzles may, at will, be brought over the mouth of the waste steam pipes to vary the draught in the furnace of the locomotive, as set forth.

SPRING CLAMPS FOR CLOTHES LINES—E. S. Haskins, of Boston, Mass.: I do not claim uniting the two parts of a clothes pin by a hinge, and closing the jaws by introducing a spiral or other spring between the opposite ends of the levers.

But I claim the combination of the barrel, the groove, and the elastic band of india rubber or other suitable substance, by which means the different parts of the clothes pin are held together securely by the same spring which closes the jaws, instead of requiring a separate device for the purpose, as has heretofore been the case.

MACHINES FOR DRESSING STONE—E. G. Hastings, of Brooklyn, N. Y.: I claim making the cross-head of cylindrical form, and the tool stock with a corresponding concavity, as shown, so that the ways or guides which carry and give direction to the motion of the said tool stock, turn freely on the said cross head, and the said cross head serves as a rest or stop, at whatever angle the said ways or guides may be adjusted, and thus always determines the depth of the cut, and causes a perfectly true surface to be produced on the stone.

[See brief description of this invention on page 188, Vol. 8, Sci. Am. A patent has been secured through our agency, in England.]

GILDING OR PLATING FIBROUS SUBSTANCES.—Albert Hock, of St. Germain, France. Patented in France Dec. 15, 1852: I claim the process, as described, of coating silk (whether organzine, train, or twist), and thread or yarn (of silk waste and thread), or yarn of cotton or other fibers or mixtures thereof with gold, silver, or other metal leaf.

FAUCETS FOR MEASURING LIQUIDS—J. B. Larwill and J. Cross of Bucyrus, Ohio: We claim the manner described, of constructing faucets, whereby they are rendered capable of measuring any given quantity, and of shutting off the supply from the cask when it is desired to discharge the contents of the faucet, and of closing the discharge of the faucet, when it is desired to measure a fresh quantity, and susceptible of being converted into a constant runner when desirable, as described.

[For illustrations and full description of this novel invention, see page 97, Vol. 9, Sci. Am.]

METALLIC GRUMMETS FOR SAILS—E. H. Penfield, of Middletown, Conn.: I claim the making of the metallic grummet of three or more pieces of metal (raised to the proper shape), when the several parts are constructed as described.

STOP COCK—O. C. Phelps, of Boston, Mass.: I claim the flange, in combination with the conical plug, constructed and operating, as described, for the purpose set forth.

Second, I claim the air cushion within the plug, constructed as described.

FAUCETS—Ezra Ripley, of Troy, N. Y.: I claim the adjustable clamps or jaws, in combination with the faucet tube, for the purpose of closing and opening the discharge orifice, when draughting or drawing fluids, constructed and operating as described.

ROTARY ENGINES—Gerard Sickels, of Brooklyn, N. Y.: I claim the method described of making and maintaining a perfectly tight fit between the ends of the cylinder and the revolving head, which carries the sliders or pistons, by admitting a pressure of steam outside of the flange of the revolving head, as set forth

[A notice of this engine may be found on page 180 present Vol.]

MACHINES FOR GRINDING COTTON CARDS—Nathaniel Smith & Asa Crandall, of North Kingston, R. I.: We claim a narrow emery card grinder, carrying a weighted forked lever or shifter, and keyed loosely on an endless or right and left screw, which, in combination with the forked lever or shifter, gives a continuous back and forward traverse to said grinder, and serves also as a shaft for it to hang and move upon while grinding the cards, the whole being as described.

[This is believed to be an excellent invention.]

SEED PLANTERS—Welcome Sprague, of Ellicottsville, N. Y.: I claim the combination of the hollow hub or grain reservoir with the tubes, piston, and rods, operated by the cam grooves, or its equivalent on the diaphram, the whole arrnged as set forth, for the purpose of insuring the deposit of the seed in the soil,

HANGING OF THE GRIPING JAW OF SPIKE MACHINES IN WEIGHTED LEVERS—J. H. Swett, of Pittsburgh, Pa.: I claim so hanging the griping jaw in weighted levers or their equivalent, as that when two spikes or a spike and a blank comes in between the griping jaws at one time, the said jaw may rise and yield to the excess of metal between the dies, and prevent the breaking of any of the parts, as described.

ROTARY CULTIVATORS—Philander Shaw, of Abington, Mass.: I claim the described method of hanging and operating the spades, &c., they being applied in one or more vibrating sets to a rotary frame, each spade being hinged to the frame and made to turn through the sector of a circle and provided with stops, and a stud to act against a stationary cam, as described, the whole being applied together and to a carriage or frame, and made to operate so as not only to dip into and raise earth, but to perform the office of impelling along on the ground the whole machine, as specified.

STEAM ENGINE FAUCET VALVES—Abijah Taylor, of Pekin, Ill.: I claim my peculiar valve, constructed, adapted, and arranged in such a manner as to perform the functions of a safety and pressure valve, as described.

FOLDING BLINDS—Mansel Blake, (assignor to Mansel Blake, James B. McAlestee, and Erastus Blake) of Sutton, N. H.: I claim the arranging a series of slats, on one set of the parallel bars of a folding frame of parallel and crossed bars, so that the slats shall not only extend from end to end of their several bars, but be made to overlap one another and thereby in connection with the folding frame, from a folding blind or shutter made to operate as specified.

OBSTETRICAL SUPPORTERS—Westel S. Daniels, of Panama, N. Y.: I claim in the described obsterical supporters, extending the thigh straps across the top of the knees and arranging them to run through rings or their equivalents where they are connected with the knee and feet straps, so that they may be seized by the hands of the user and drawn up to increase, or slackened to graduate the pressure of the back pad against the back as desired without changing the position of the body, legs or feet as described.

SMUT MACHINES—Lewis Fagin, Cincinnati Ohio,: I claim my method, or its substantial equivalent, of arranging a blowing apparatus where the upper or suction fan takes the air at the center and discharges on the periphery, to precede (on the same shaft) a scouring mill, for the purpose of taking from grain the smut, chaff, &c., before the scouring process is commenced and afterwards thoroughly scour the same; thus constituting the cleansing and scouring processes the duty of a single machine as described.

I also claim the cylinder hopper and feed pipe as arranged, or their equivalents, and for the purpose described.

I also claim the collar as arranged and for the purpose described.

I also claim the guide as arranged and for the purpose described.

I also claim the scouring cones severally and collectively with their circular and horizontal grooves and perforated terraces, or their equivalent, and in combination with the conical fan and beater, as described.

SECURING WINDOW SASHES—Alpheus Kimball, of Fitchburg, Mass.: I do not claim confining window strips or beads by letting them into mortices in the top and bottom of the frame, as this has been done before. but I claim confining window sashes by means of strips, which are raised into deep mortices in the top of the frame a sufficient distance to enable them to be dropped into shallow mortices at the bottom of the frame, the strips being held against the sashes by the pressure of a screw or other analogous device in the manner described.

Also the method of securing and tightening the sashes by means of pressure upon the exterior of the sash strip whether it be produced by screw, in the manner described.

GRAIN HARVESTERS—Daniel S. Middlekauff, of Hagerstown, Md.: first, I claim the rotary knives or cutters, the edges of which pass by each other for the purpose of forming a continuous edge for the purpose of cutting the grain.

Second: I claim the reels and the spring ketch and projection on the wheel in combination with the apron, for the purpose of supporting the grain in an inclined position as described.

MACHINES FOR DRILLING STONES—Simon Pettes, of New York City.: I claim so placing on the sliding frame the windlass with ratchet, whose paul is acted on by the drill head at each desent thereof, and these feeds the entire mechanism as the work proceeds, as set forth.

PROCESSES FOR MAKING VARNISHES—Jonathan Burrage, of Roxbury, Mass.: (assignor to J. Burrage, and F. W. Newton, of Newton Mass): I am aware that the exudations from the Pinus Canadensis and Pinus picea (which exudations are respectively known in commerce by the names of Canada Balsam, and Venice Turpentine,) have been mixed with essential oil or spirits of turpentine in the manufacture of varnishes. I therefore do not claim such mixtures as forming any part of my invention. Nor do I claim the employment of sulphate of zinc, litharge or magnesia in oil for the purpose of imparting drying qualities thereto, Nor do I claim in making a varnish the employment of a virgin turpentine, or that which is in the natural and liquid state it has when it exudes from the tree, but as by exposure of the crude or natural liquid turpentine of the pinus abies or pinus silvestris to the action of air and light for several weeks or months, it becomes hard and brittle and decolorized and otherwise changed, or has its essential oil evaporated and is otherwise purified of much that is objectionable in varnish and in fact becomes another, or highly improved article for the manufacture of varnish, and as such, has never to my knowledge been used in making varnish, but only in the composition of plaster or for other purposes in medicine, and in calico printing, and some other arts, it being known in commerce by the names of Gum Thust or Gum Sass,

I claim the described process or mode of making varnish, viz., by combining Gum Thust or Gum Sass, with the essential oil of turpentine, and treating the mixture as specified.

SEED PLANTERS—J. G. Macfarlane, of Perry County, Pa.: I claim the combination of the action of the levers, cams, spring, and the weight of the scraper, to clean the wheel.

DESIGN.

PANNEL ORNAMENT FOR STOVES—Isaac De Zouche (assignor to Louis Potter), of Troy, N. Y.

NOTE.—In the above list of patents, seven of the specifications and drawings were prepared at the Scientific American Patent Agency.

Tin Foils---Crooke's Patent.

My invention consists in such improvement in the manufacture of tin foils and sheets, that by it I accomplish the reduction of the cost, though retaining those qualities which are essential to the purposes for which such foil or metal is required. This I effect by combining the baser and cheaper metal, lead with tin, not, however, in the form of an alloy or mixture, but so that each metal will be kept perfectly distinct, the tin or superior metal being only exposed, while the lead or inferior metal is encased within. In order to make such sheets or foils, a peculiar ingot or slab must be first made, by which the whole amount of metals to be contained in the intended sheet or foil must be joined at their surfaces, and retained in such position that the subsequent action of the rolls shall not be able to displace or extend one metal more rapidly than the other, for it is evident that the lead by reason of its being the softer and more yielding metal would be squeezed out in an undue proportion to the tin, were it not confined on all sides by the tin. I therefore make the ingot or slab for rolling, in the following manner:—First, a metallic mold is made which shall determine the size of the slab to be cast, the cavity in such mold may be, say six inches wide, one inch thick, and ten inches long; then prepare a slab of lead as much less in size than the cavity in the mold as is designed for the different proportions of the metals, say of the following dimensions, five and one-half inches wide, nine and one-half inches long, and half of one inch thick. This, when suspended in the center of the mold, will leave a clear space all round, and the tin can then be poured in. To accomplish this suspension properly I prepare small blocks or posts of tin, of a length equal to the space left between the lead and the sides of the mold, and by placing these around on all sides, I sustain the slab of lead exactly in the center. The surface of the lead being properly clean, or properly fluxed or coated with an alloy of lead and tin, the mold is ready to receive the tin which is poured in until the whole of the space is filled, the lead being then completely encased within it. The posts of tin of course combine with the fluid tin poured in and form part of the solid mass. The slab is now ready for the rolls, and may be extended into sheets and foils of any degree of thinness, from this construction of the slab or ingot, it is evident that the lead cannot escape from the tin, but must extend and be pressed out with it, in exactly the same manner and at the same rate, thus ensuring perfect equality in regard to the given proportions first adopted, as to every part of the sheets, no one part having more lead in combination with it than another. Thus foils or sheets are produced, which for many of the purposes to which those of pure tin are applied, such as for wrappers of tobacco, caps for bottles, &c., are fully equal in the qualities required to those of pure tin, while they are furnished at a greatly reduced cost.

[The above patent was issued Feb. 7, 1854, and the claim may be found on page 179, present volume "Scientific American."

Icebergs at Sea.

The captain of the packet Middlesex, from Liverpool, arrived at this port last week, reports that his vessel was locked in the ice for five days and had a very narrow escape from destruction. A large quantity of ice was passed through, he says, and must have been nearly 300 miles in length. Thirty icebergs were counted at one time from lat. 47 to lon. 46 51.

Recent Foreign Inventions.

RAILWAY CONSTRUCTION.—G. K. Douglas, of Chester, England, has patented some improvements in the permanent way of railways. In this invention, the chair is made with two pair of jaws, which are cast together in the usual manner, and are sufficiently wide apart at the top to admit the rail. Between the jaws and the body of the rail is a plate, enlarged between the jaws, in order to strengthen it, and another plate is held in contact with the other side of the rails by vertical wedges. These plates and wedges the inventor prefers to make of cast-iron, but they may be made of wood. When the wedge is of wood, it is requisite to have a hole in the chair, through which the wedge can be forced when the rail has to be removed.

STEAM-ENGINES.—J. E. McConnell, C. E., of Wolverton, England, has patented some improvements in steam-engines and boilers for marine purposes. In this invention, a set of cross partitions are introduced in the water space above the fire-box, for the purpose of preventing the rolling of the ship from sending all the water into any part of the boilers, so that it is constantly kept well spread over the available heating surface. For the prevention of deposit and incrustation, vessels which can be detached at pleasure, of suitable form, are placed under the barrels of the boilers to receive the deposited or precipitated matter from the water, or the deposit can be withdrawn by a blow-off cock, or by other suitable means.—Separate or additional fire-doors are also introduced into the boilers beneath the fire-boxes through the water spaces for the admission of atmosphereic air, to render the combustion more complete.

ROTARY ENGINES.—M. de Beaujeu, of Paris, has obtained a patent, by which he claims:—1. The construction of apparatus for producing in a close vessel a continuous current of liquid in the direction, by the pressure of the steam of water or other liquids, or compressed air, or other elastic gasses, in a cold or heated state, acting upon the water indirectly, by means of a fatty non-evaporating body, such as rectified sperm oil, for the working of water-wheels, of turbines, re-action wheels, pumps, and other similar machines.—2. Mechanical arrangements for working the distributing steam-valves of the said apparatus, by the action of the turbine, or other hydraulic machine to which its motion is applied.—3. The construction of a turbine with inverted paddles, for the application of said current to forward and backward propulsion.

ELECTRIC CURRENTS.—M. Fontaine-moreau (for a correspondent) has patented an improved mode of producing an electric current. This electric battery is composed of 28 elements, each being formed of a trough, an amalgamated zinc cylinder, and a porous vessel containing one or more charcoal elements, disposed within each other in the usual manner. The charcoal may have the form of a cylinder, and a set of three of them, or a system of plates, united at the top, may be employed, in order to multiply the surface, and increase electric action. The troughs may be of a flat or square shape in place of the round. The 28 troughs are placed in a long outer casing, divided into two principal compartments, which are sub-divided into 14 cells, to receive the several elements. These cells are open at top and bottom, and have two small cross-pieces set at the bottom part for receiving the troughs. The casing is supported by a tresle at each end, being set at half their height from the ground. Set screws on the feet of the trestle serve to put them on a level, and on the top of the trestle two wooden axes are set, extending from one end to the other, and turning on pivots.

HAY MEAL.—C. J. Daniel, of Bath, England, patentee.—Some time since we spoke of grinding hay and making it into meal for feeding cattle; the above named gentleman has secured a patent in England for this product. What the value of the patent may be we do not know.

BRIDGES AND VIADUCTS.—J. Macintosh, of London, patentee.—This invention consists in combining a series of bow and string arches into one girder beam, in such a manner that each bow or arch springs from the crowns of the two bows or arches to which it is connected.

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New Inventions.

Knitting Machines.

Brown S. Wood, of Burrillville, R. I., has invented several new and very useful improvements in Knitting Machines, for which he has taken measures to secure a patent. The object of the improvements in such machines have all in view the knitting of ribbed goods by power. The first improvement consists in a certain arrangement of wide and narrow jacks for the purpose of forming a row of long and short loops, which are laid in proper positions to be caught by the needles—the long loops by the *rib* needles, and the short loops by the other set of needles and drawn through similar loops previously formed in the same manner.

A second improvement consists in operating the jacks by means of a double slur, to which the heads of the jacks are so fitted that the narrow jacks are operated upon in advance of the regular turn, in order to prevent the wide jacks in advance of them from taking up the thread necessary to form the narrow loops, which, if allowed, would prevent the proper formation of the loops, and cause breakage of the thread.

There is also an improvement in the arrangement of the movements of the two sets of needles; another for the arrangement of the rib needles in the combination with a creased presser, by which they require to be sprung into the proper position to enter the loops made to receive them. After these needles have entered the loops, and the pressure of the creaser removed, they spring back and draw the loops lightly around them, so that on their retiring from their loops they always pass into their hooks.

The thread carrier on this loom delivers its yarn in a direction perpendicular, or nearly so, to the needles, to prevent its rolling or sinking. There are some more new improvements embraced in this machine, a clear idea of which cannot be obtained without engravings, they are all considered to be very valuable, by the inventor.

Bending Flanges on Wrought Iron Beams.

Julius H. Kroehl, of New Yow City, has taken measures to secure a patent, for an improvement in machinery for bending flanges on wrought iron beams. There is a pair of horizontal, and a pair of vertical rollers; the former pair has one roller with a face of the full depth of the beam, and the other has its face the depth of the beam minus the thickness of the flanges. The vertical rollers are both alike, and are of a width a little greater than the extreme width of the flanges. They are arranged opposite the space between the horizontal ones, and work in close contact with the sides of the roller. In order to give the flanges and their beams, a taper or an elliptic, or other curved form, the vertical rollers have flanges, whose faces bear on the edges of the flanges of the beam, and cause the said rollers to receive such a movement in the direction of their axes, and apply such a force in that direction as bends the flanges of the beam to the desired form.

Clothes Horse or Bars.

Dewey Phillips, of Shaftsbury, Vt., has applied for a patent on a new mode of making bars, on which to hang clothes, for drying, or after they are ironed. He constructs the bars of a series of horizontal slats secured to a vertical standard, which can be folded up into a very small compass, when not used, thus making them more compact and convenient for housewives.

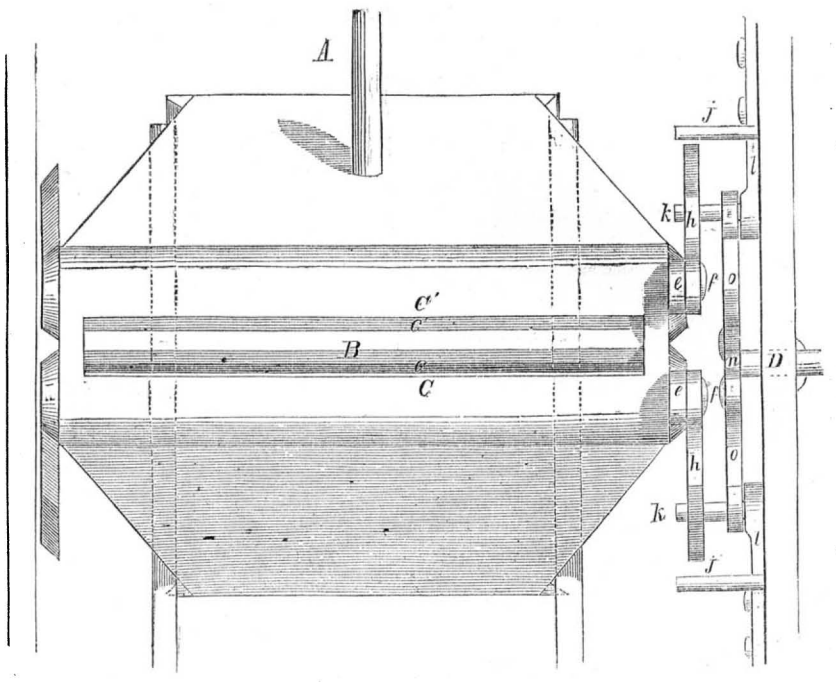
Ventilators.

Joseph Cooley, of New York, City, has applied for a patent for an improvement on ventilators, which consists in exhausting the impure hot air from apartments, by applying a ventilator of peculiar construction to the chimney in the inside of the room above the mantlepiece. This ventilator is under the control of persons in the apartment. It has a revolving fan which takes the hot air from the room, but suffers no draught to come from the chimney back through it.

Improved Candlestick.

T. Rose, of Cortlandville, N. Y. has made a very useful improvement in candlesticks; the nature of which consists in enlarging the inner sliding tube of the candlestick, and providing it with a concave grease tight socket, for the purpose of receiving and retaining all the melted tallow that may run down the candle during the time it is burning, and in connection with this arrangement there is a series of sharp pins on the concave socket, to enable the candlestick to receive and hold firmly, candles of various thicknesses. Measures have been taken to secure a patent.

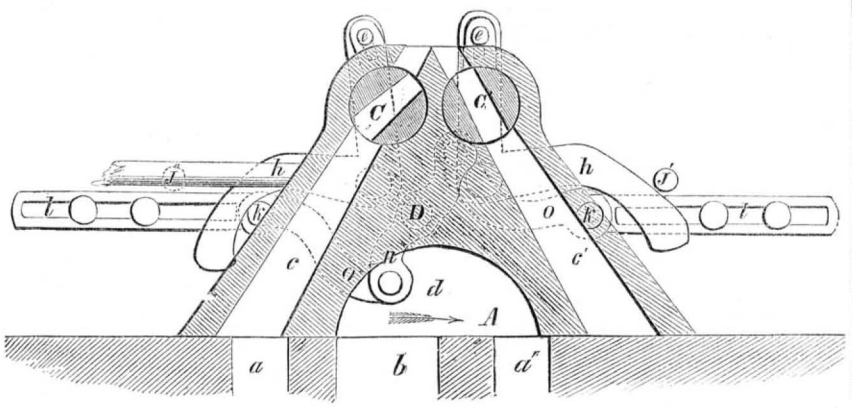
STEAM ENGINE---NEW CUT-OFF.---Fig. 1.



The annexed engravings are views of an improvement in the Cut-Off of steam engines, invented by James Montgomery, of Bridgeport, Conn., who has taken measures to secure a patent for the same. Figure 1 is a plan view of a steam chest with a slide valve and cut-off, constructed according to the improvement, and figure 2 is a longitudinai section of the same; figure 3 is an elevation of the mechanism, by which the action of the cut-off is regulated. The same letters refer to like parts.

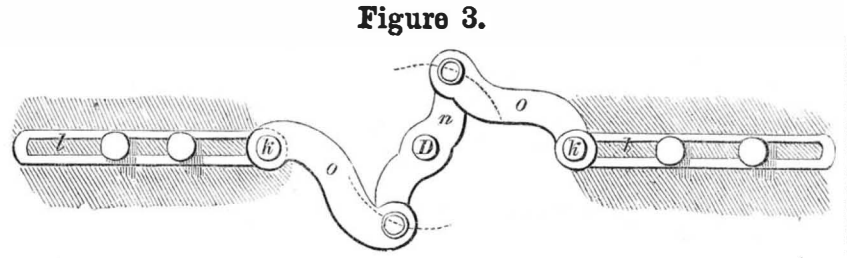
The nature of this invention consists in the employment—as a cut-off—of two cocks which are fitted to the slide valve in such a way as to be capable of opening and closing the passages in the valve through which the steam passes to the steam ports of the cylinder, and which are moved at suitable times to open and close the said passages by means of levers with which they are furnished; these levers are brought in contact—by the motion of the slide valve—with certain fixed and adjustable stops in the steam chest. These cocks constitute a perfectly balanced cut off, and the great friction produced by a slide or slides on the back of the valve is obviated.

Figure 2.



A is the valve seat, a, a' are the steam ports, and b is the exhaust port; B is the slide valve with steam passages, c c', through which the steam passes to the ports, a a', and a cup, d, to conduct the exhaust steam to the exhaust port; similar to the common slide valve which has a cut-off slide working at the back of it. The back part of the valve is suitably formed to receive the cocks, C C', which open and close the passages, c c', and is widened so as to increase the length of the passages, and thus enable their width to be reduced so that the cocks may be opened and closed with a less movement. The cocks may be of any well known construction, and each is furnished at one end with a short lever, e, which carries a pin, f, to work in a slot in a bent lever, h, whose fulcrum is on a pin in the side of the valve below the cock. The cocks are opened and closed by moving the levers, h h. These levers receive the necessary motion to open the cocks by coming in contact with fixed stops, j j', within the valve chest, near the termination of every stroke of the valve, and then receive

Figure 3.



the necessary motion to close the cocks and cut off steam by coming in contact with pins, k k, at any desired point in the next movement of the valve. The pins, k k, require to be adjustable to close the cocks and cut off the steam at any desired point, and for this purpose they are attached to two swinging arms, l l, which hang on fixed studs, m m, on the side of the valve chest. They are adjusted by means of a small beam, n, which is connected to the arms l l, by links, o o. The axis of the beam is a spindle, D, which passes through the side of the steam chest, and is connected with a governor or with some device for adjusting by hand. By turning the spindle the pins, k k, are brought nearer together or forced farther apart.

The operation of the cut-off will be understood by reference to figure 2, where the pins, k k, are arranged to cut at half stroke.—The valve is supposed to be moving to the right, as indicated by the arrow, and to have nearly finished its stroke. The engine piston is supposed to be moving in the same direction and to have arrived nearly at half stroke. The lever, h, of the cock, C, is in contact with the pin, k, and the cock is closing. The lever, h, of the cock, C', is in contact with the stop, j', and the cock is opening. By the time the valve reaches the end of its stroke, and the piston is at half stroke, the cock, C', will be wide open, and the cock, C, closed, and the steam cut off. The piston is caused to finish its stroke by the expansion of the steam in the cylinder, while the valve returns half way. The valve having passed its half stroke opens the port, a', to admit the steam for the return stroke of the piston. The weight of the levers, h h, which is very trifling, is supposed to be balanced, or to be counteracted by the friction of the cocks, so that the cocks will remain in the position in which they are left by the pins and stops, and hence the cock, C', has remained open, as it was left by the action of the stop, j, and the steam is free to enter the port, a'. The cock, C, during this time has remained closed, and both cocks remain in the positions now described, until the lever, of C', comes in contact with the other pin, k, and the lever of C, with the stop, j', after which the continued motion of the valve causes the cock, C', to be closed to cut the steam off, and C to be opened ready for the admission of steam when the passage, c, is brought opposite the port, a by the return of the valve. During the return of the valve the above described action is reversed.

By setting the pins, k k, wide apart, it will be understood that the levers, h h, will respectively be brought in contact with them at an earlier point in the stroke of the piston. By setting the pins in such a position as not to be struck by the levers, h h, the cut-off may be made inoperative. The alteration of the position of the pins is effected by turning the spindle, D. In stationary engines it is proposed to connect this spindle with a governor in such a way that the increased speed of the governor shall force the pins farther apart, and the decreased speed draw them towards each other, and thus govern the engine by the cut-off. In locomotives or engines on which no governor is desirable, or can be conveniently employed, the spindle requires to be fixed in the proper position to adjust the pins to cut off at the desired point.

This cut-off is particularly well adapted for use in connection with a governor, owing to its being balanced, and therefore working without sufficient friction to produce any resistance to the operation of the governor whose slightest variations would instantaneously produce the desired effect.

More information may be obtained by letter addressed to the inventor.

Iron Houses.

Charles Mettam, of New York City, has taken measures to secure a patent for an improvement in the construction of iron houses. The nature of the improvement consists in erecting the columns of the upper stories upon chairs, which can be easily adjusted to any desirable position on the breast summers, and which when raised directly over the columns of the lower story to support other upper columns, serve to connect the breast summers in such a manner as to provide for their longitudinal expansion and contraction.

Napping Cloth.

Joseph Weight, of Lawrence, Mass., has taken measures to secure a patent for an improved machine for napping cloth. It consists in the employment of an endless card sheet in combination with a transverse card belt. The latter belt keeps the cloth stretched to its proper width, for the action of the endless card belt, which presents a far larger carding surface than the common card cylinder.

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Scientific American.

NEW YORK, MARCH 25, 1854.

Harbor Improvements.

We have been told in private—and statements have been made in public—that New York is now the most extensive shipping port on the globe. We think it probable, that both London and Liverpool, still surpass it, but they cannot do so long, for the increase of its shipping is so rapid, in comparison with that of any other city, that it must soon become the shipping Metropolis of the world. And yet, with its rapid rise and progress, and with the many brilliant hopes of its future greatness and grandeur, a dull cloud sits brooding over its waters, warning us, that if measures are not adopted for the improvement of its harbor, the time will yet arrive when no tall ships or mammoth steamers will be seen at its wharves, but instead thereof, only flat bottomed lighters, or contemptible fishing yawls.

On some parts of our coasts, the sea is continually making encroachments on the land, while on other parts, the land is continually making encroachments on the sea. Around New York harbor, the land has been steadily creeping out into the sea circumscribing the domain of its proud waves, and the channel of our harbor is daily becoming more precarious. Within a very short period, two of our Ocean Mail Steamers have grounded while coming up to their docks, and one of them was seriously detained for nearly a week in her dangerous position. The news of such accidents carried abroad, tends to detract from the character of our harbor, and as a natural consequence, acts unfavorably upon the interests of our city. Large deposits of mud have for years been accumulating in its waters without any sensible or energetic efforts being made to prevent or remove them. This is a public fact, "known and read of all men." The "Board of Commerce," in this city, have frequently directed attention to the subject, and have made some efforts to induce the proper authorities to remedy the evils. It does not appear, however, that there is any prospect of such Powers doing anything effectual for their permanent relief. Our city authorities—who should be selected from our principal merchants, manufacturers, and mechanics—have never, as a body, been the right class of men for such offices,—they have neither exhibited a sensible patriotism nor even an enlightened selfishness, for the prosperity and welfare of the city. They have generally been characterised by an intense personal selfishness, commingled with a deep ignorance of the true interests of the community. If tried by an intelligent jury, they would be found guilty of obstructing the navigation and injuring the city's commercial interests: they have suffered millions of tuns of sand and dirt to be washed from our streets into our docks, and out into the channel, as if they were elected and paid for the very purpose of destroying its commerce.

A most reprehensible custom has been practiced in the covering up of newly paved streets, with a thick stratum of sand, apparently to conceal defective workmanship, increase filth and dust, and at last to fill up our harbor through the agency of those public scavengers—heavy rain showers.

Why our merchants have suffered such nuisances to exist so long, puzzles us to conjecture. Why have they been so long callous to their own interests as to allow such quantities of mud to be carried into our harbor and docks to ground steamships and imbed large clippers—like the "Great Republic," which was burned to a crisp for want of water to float her out from danger?

Those who have the shipping interests of the city at heart, must not trust to General, State, or City Governments for the improvement of the harbor,—they must rely more upon themselves. The deposits from our streets can be prevented by keeping them clean, and this will also tend to increase the general health and comfort. The channel can be kept free and open by dredging machines—not those mudhogs that are now employed at the docks, but large steamboats, with powerful engines and proper excavating apparatus attached to them. One million expended for this object, every year, would be money well and prudently invested. If the General Government does not appropriate enough for the improvement of the harbor, our merchants should do it themselves—they should act with a generous and an enlightened spirit in this all-interesting matter. The merchants of New York can command any amount of means to accomplish any object for the good of the city; ignorance of their true interests they cannot plead, let them not subject themselves to the charge of stupidity.

The Great Telegraph Case.

We have at last received a printed copy of the decision of the Supreme Court of the U. S. on the patent of Prof. Morse, as has already been noticed and commented on by us.—It differs in no leading feature from the facts we have already presented. It was delivered by Chief Justice Taney, and is exceedingly clear and forcible. The reasoning is incontrovertible, and it surprises us that there should have been a single dissenting voice on the Bench, but there were three, Justices Nelson, Grier, and Wayne, whose opinions are also before us. It is a fact highly creditable to one of Prof. Morse's own counsel, George Gifford, Esq. of this city, that this decision is exactly in accordance with his views of the whole matter, as we judge from his printed arguments set forth on the questions at issue; this shows us that he has a profound appreciation of the principles of our Patent Laws.

The report of the minority takes the ground that an art is patentable independent of the means of executing it, but the quotations given from English decisions, such as that of James Watt, for condensing steam in a vessel separate from the cylinder, is a very unfortunate one; for if an art were patentable independent of the means, then James Watt's patent must have been void, as his great improvement was for a *means*—his separate interior condenser in combination with the steam cylinder. To condense the steam in the cylinder was an old and well known practice, and a surface condenser never was considered an infringement. The reasoning of the minority report is very vague in comparison with that of the supreme decision.

It would be superfluous in us to say any more upon the subject now, but we cannot help presenting the following extract from the opinion of the court on the provisions of the acts of Congress in relations to patents. It is the clearest exposition, in the fewest words, of the principles of law on which the validity of patents is based, we have ever read.

"Whoever discovers that a certain useful result will be produced in any art, machine, manufacture or composition of matter, by the use of certain means, is entitled to a patent for it; provided he specifies the means he uses in a manner so full and exact, that any one skilled in the science to which it appertains can, by using the means he specifies, without any addition to, or substraction from, them, produce precisely the result he describes. And if this cannot be done by the means he describes, the patent is void. And if it can be done, then the patent confers on him the exclusive right to use the means he specifies to produce the result or effect he describes, and nothing more. And it makes no difference in this respect whether the effect is produced by chemical agency or combination; or by the application of discoveries or principles in natural philosophy, known or unknown before his invention; or by machinery acting altogether upon the mechanical principles. In either case, he must describe the manner and process as above mentioned, and the end it accomplishes. And any one may lawfully accomplish the same end without infringing the patent, if he uses means substantially different from those described."

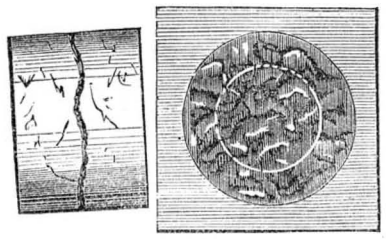
Barrows Rotary Engine.

We understand that Mr. Barrows, of this city, the inventor of the rotary engine, which bears his name, and for which he received a patent, a few weeks since, is about to form a joint stock company with a large capital to carry out his invention. We have also been informed that he will soon visit the cities of Cincinnati, Louisville, St. Louis, &c., for the purpose of endeavoring to get his engine introduced upon our western waters; no inventor has exhibited more determination and energy in prosecuting his experiments, than Mr. Barrows.—His confidence in what his rotary engine has done, and what it can do is unbounded and unfaltering. Our western engineers will no doubt give him a fair hearing.

Bank Note Paper.

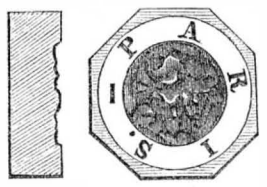
The annexed figures are views of recent improvements in paper for bank notes to prevent counterfeiting, by M. Millet, of Paris. The object of the invention, is the production of irregular marks upon the paper, for as the inventor justly observes, "Distinguished artists and engravers have produced remarkable results, as well with regard to complextures of design as

Fig. 1. Fig. 2.



to precision and beauty of workmanship, yet it has always been possible to imitate the marks, in spite of their multiplicity of lines, because, inasmuch as the devices were produced by the hand of man, they must necessarily admit of imitation in artistic hands." Reasoning on this point, it occured to him, that in oder to manufacture a paper which would be impossible to counterfeit, no mechanical means, nor yet any direct handiwork, should be employed in producing the distinguishing figures, as such work must always be more or less regular and geometrical, and, therefore, susceptible of imitation in the hands of a clever artist." M. Millet, therefore, employs what may be called, "chance" figures—such, for example, as the chance irregularities of surface consequent upon the fracture of a piece of metal. In carrying out this idea, he obtains the nucleus of his design from the transverse fracture of a block metal, wood, or coal, fig. 1; and then, placing between the corresponding irregular surfaces of such fracture a piece of lead, gutta percha, or other impressionable substance, he obviously produces

Fig. 3. Fig. 4.



corresponding irregular marks on each side of such soft material, as at fig. 2. Then supposing a portion only of such fractured surface to be made use of in the intended design, certain ciphers or devices, moulded in wax, are added to the primary figure, forming a matrix or mould, from which a reverse impression is obtainable in plaster, or any soft plastic substance, as in fig. 3—fig. 4 being the transverse section. From this again, any required number of metal or composition moulds may be made for actual use, in impressing their advice upon the wire-cloth of the frame in which this paper is made, and thus each sheet of paper is indelibly marked with the figure of the original fracture, and the word "New York," or whatever word or cipher, may be added to it. Should a clever artist succeed in imitating the irregularities of the mark, he would still be very far from producing an accurate copy, inasmuch as he has to follow, not only the various outlines, but also the light and shade effect.

Hobb's Lock Picked.

There can be no doubt of the fact that "Day & Newell's American Lock," under the care of Mr. Hobbs, now in London, has been successfully picked by Mr. Goater, foreman of Chubb's establishment. A long correspondence has in consequence taken place between Mr. Hobbs and the successful picker of his lock. The "London Mechanics' Magazine" is very severe upon our countryman, for endeavoring to bring English locks and lockmakers into disrepute. It accuses him of asserting in one lecture that his lock could *not* be picked, and again (after he heard it had been picked) making the statement that it *could* be picked. It therefore endeavors to fasten the charge of tergiversion upon him. The following is Mr. Goater's reply to Mr. Hobbs; it presents the English side of the question:—

The qustion is, did I or did I not fairly pick, last week, four of Hobbs' new American locks, each lock when sold by Mr. Hobbs being accompanied by his printed guarantee that it was 'secure against picking?'

"An objection is taken by Mr. Hobbs, that I have only operated on one sized lock, and that a small one. To this I reply, the size or shape of the lock makes no difference to me, except that the larger the lock, the easier it is picked, and it can be opened as easily, fixed as unfixed.

Mr. Hobbs says he had some locks at the second meeting, with improvements in them to baffle my operations. After he had explained these, I told him plainly, before all the civil engineers present, that they would not stop me, and I could pick them as readily as I had done the others.

In conclusion, Mr. Hobbs really has no right to complain of this exposure; he began the war against the English locksmiths in 1851."

There is no necessity for any controversy on the subject. The simple question is, "has Hobbs' lock been picked?" If it has, and that fairly, it settles the whole matter. There does not seem to be any doubt of the fact, and this shows us *the unpickable lock* has yet to be invented.

Ventilating Car.

We were present a few days since at the trial trip of a new Ventilating Car, invented and patented by H. Ruttan, of Coburg, C. W. The car is now running on the New York and Erie Railroad. The plan of construction is to take a supply of fresh air from the top or sides of the car by a funnel-shaped opening, pass it down to the bottom of the car over a water tank to free it from dust and cinders, and introduce it to the inside through a double stove in winter, and a pedestal in summer. The current of warm air in going out of the car passes its whole length beneath the passenger's feet, and is discharged at the rear.

The experiment was highly satisfactory, every conductor on the route spoke highly in its favor, and said that passengers were unanimous in their approval. The only complaint we heard was from a single individual, who complained that the air was too fresh, but as the temperature was pretty constant at about 65°, there could be no just cause of complaint on this score. There was a singular equality of temperament throughout the car. Indeed, at one time the thermometer indicated the coldest portion to be the part nearest the stove. We noticed during the latter part of the trip a fact which spoke volumes in its favor. Every seat in the car was occupied, and there were even several standing in the passage. On going to the other car, which was one of the ordinary construction, there were only about a dozen passengers, yet even with this difference in the consumption of oxygen, the change in the smell of the air was decidedly disagreeable.

We are acquainted with no plan of car ventilation which we consider as good as Mr. Ruttan's, and we are disposed to think that when he shall have made some contemplated alterations, rendering it more simple and at the same time more thoroughly efficient in freeing the air from dust, his plan will be nearly all that can be desired. We can only say in conclusion that railroad companies deserve and will certainly receive the censure of the public unless they adopt this or some better plan, (if a better one is to be had,) of car ventilation. Railroad travelling as at present conducted is often little better than slow torture. That route between New York and the west, which will adopt early this summer some good ventilator like Mr. Ruttan's, will receive three-fourths of the travel.

Some of the pianoforte makers in New York City have struck against an innovation of old rules,—a change from piece-work to day's wages.

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Water Wheels---The Turbine---Article 2.

[The annexed is an essay on the turbine water wheel, by James B. Conger, of Jackson, Tenn., a practical millwright of great experience and scientific attainments, an inventor and patentee, and who has devoted much attention to the subject. It is divided into a series of chapters, which will be continued through several numbers, some of which will be illustrated by diagrams.]

MECHANICS—WATER AT REST.—1 In mechanics, all matter may be considered as continually under the operation of forces, which if mutual and in opposite directions, maintain it in equilibrio, but if a portion of the force acting in any direction on a body at rest be removed the body will then tend to move in an opposite direction to, and with a force equal to the force removed.

2 The term *force* is applied to every cause which impresses on matter a motion, or tendency to motion. Action and re-action are equal in degree and opposite in direction, there can be no force acting in one direction without an equal force acting in an opposite direction, or rather the same force acts in opposite directions. Hence force may be termed that which causes matter to tend, to separate, or approximate.

3 MATTER IN MOTION.—The indifference of matter to a state of motion or rest, is termed inertia. It is a consequence of this principle that one body when struck by another exerts an effort of resistance to the impulsion whilst acquiring a portion of the motion of the striking body; and while in motion exerts an equal effort to having its motion arrested. By this same principle, a body having received an impulse must move uniformly in a right line, if not opposed by any obstacle, for there can be no reason why the body should deviate to one side rather than the other, nor that its motion should be accelerated rather than retarded. It is likewise a consequence of inertia that a body while in motion opposes a change in its direction while being deflected by a force and deviates from a right line a distance equal to that which an equal force would have caused it to move from a state of rest in an equal portion of time.

4. These two principles, force and inertia, originate, carry on, and terminate all mechanical operations, both in nature and art, the worlds are governed and regulated by them, and mechanicians know of no other principles by which operations are effected.

5. Motion is the act of changing the place of bodies, the passing of a body from one place to another, or the change of distance between bodies. Space being infinite, motion can be relative only. Bodies on the earth may move as relates to the earth, the earth move as relates to the sun, the sun move as relates to the stars, and they move as relates to each other, but if there was but one body in space, it could not be said to move. Hence a body in motion is not effected by that motion, only so far as it brings it under the influence of some other body, and the influence will be the same whether it move, or be at rest, and the other moves.

6. If, while a body is moving in space, it be acted on by an incessant force tending to draw it to a point, perpendicular to its line of direction, the body will describe a curve around the point. And if the force be such as to generate an equal velocity in the body, if at rest, by acting on it through a space equal to half the distance from the body to the point to which it tends, or arrest its motion if directly opposed to it through the same space, the curve will be a circle. And in all cases of circular motion, the force required to compel the body to leave a direct line and describe a circle, will equal that which would bring the body to rest by directly opposing its motion through a distance equal to half the radius of the circle.

This resistance to a change of direction is called centrifugal force, and the force which compels the body to describe a curve is called centripetal force.

7. If a body free to move be acted on by an incessant force by article 3, motion will ensue which will be accelerated so long long as the force acts, or the body has space to move in, unless arrested by some other force. During the first instant of time the body will pass over a certain space, and will have acquired a certain velocity, which would carry it over double the space in the next instant of time, but the force being incessant, will cause the body to move the same distance in the next instant of time, independent of the previously acquired velocity, which jointly will carry it over three times the distance the second instant of time that it moved in the first, and its velocity will be doubled. Hence the spaces passed over in equal successive portions of time, will be as the odd numbers, 1, 3, 5, 7, &c., and the velocity acquired at the end of each portion of time, simply as the times 1, 2, 3, 4, &c. The velocity will be as the time the force is acting, and the space passed over as the square of time.

Heavy bodies subjected to the action of gravity near the surface of the earth will describe, in the first second of time, a distance equal to 16·0799 feet. But for all practical purposes 16 feet is near enough the truth. A heavy body will fall from rest one foot in the first fourth of a second, and acquire a velocity of one foot per eighth of a second, therefore the square root of the distance fallen in feet, will equal the velocity in feet per eighth of a second, which if multiplied by eight will give the velocity in feet per second.

8. The want of uniformity in terms as used by writers, has caused considerable confusion, and many misunderstandings. The terms below will be used as indicated.

Power is the term used to express the power of a certain force, or a force of certain intensity operating through a certain space, whose unit is one pound descending by, or raised against gravity one foot. When the force is constant it is usual to estimate the power at so much per second or minute, as for instance 33,000 pounds raised one foot per minute, or 550 pounds raised one foot per second, is termed a horse power. The effect produced by a power is estimated similarly.

Momentum is a term used to denote the product of a certain force, acting during a certain time. Its unit is a force equal to one pound, acting during the time of one fourth of a second. The velocity in feet per eighth of a second, multiplied by the mass will equal the momentum of a body in motion.

The momentum of a body in motion is by article 2 and 6, the intensity with which it will act, or the pressure it will exert against an obstacle which arrests its motion in one fourth of a second of time, or is equal to a force that would give the body its motion by acting on it one fourth of a second.

Intensity of a force is its capacity to generate motion. Its unit is equal to the force of gravity on one pound of matter near the surface of the earth.

Impetus is the force of motion, or the power of a body in motion, to produce effect, and is equal to the square of the velocity multiplied by the mass.

The units of space and time being arbitrary, that of velocity is arranged to correspond with that of power. The square of the velocity in feet per eighth of a second multiplied by the mass, will equal the power necessary to generate the velocity.

The Wants and Ills of Life.

REST OF THE SABBATH.—The "North British Review" illustrates the importance of sufficient sleep on a parallel with the natural history of the Sabbath:—"The Creator has given us a natural restorative—sleep; and a moral restorative—Sabbath keeping; and it is ruin to dispense with either. Under the pressure of high excitement, individuals have passed weeks together with little sleep or none; but when the process is long continued, the over driven-powers rebel, and fever, delirium and death come on. Nor can the natural amount be systematically curtailed without corresponding mischief. The Sabbath does not arrive like sleep. The day of rest does not steel over us like the hour of slumber. It does not entrance us almost, whether we will or not; but, addressing us as intelligent beings, our Creator assures us that we need it, and bids us notice its return, and court its renovation. And if, going in the face of the Creator's kindness, we force ourselves to work all days alike, it is not long till we pay the forfeit. The mental worker—the man of business, or the man of letters—finds his ideas coming turbid and slow; the equipoise of his faculties is upset, he grows moody, fitful and capricious; and, with his mental elasticity broken, should any disaster occur, he subsides into habitual melancholy, or in self-destruction speeds his guilty exit from a gloomy world.—And the manual worker—the artisan, the engineer, by toiling on from day to day, and week to week, the bright intuition of his eyes gets blunted; and, forgetful of their cunning, his fingers no longer perform their feats of twinkling agility, nor by a plastic and tuneful touch, mold dead matter, or wield mechanic power; but mingling his life's blood in his daily drudgery, his locks are prematurely gray, his genial humor sours, and slaving it till he has become a morose or reckless man, for an extra effort, or any blink of balmy feelings, he must stand indebted to opium or alchohol."

SLEEP.—Sound, connected, early, refreshing sleep, is as essential to health as our daily food. There is no merit in simply getting up early.—The full amount of sleep requisite for the wants of the system should be obtained, even if it requires till noon. I go to bed at nine o'clock the year round, and I stay there until I feel rested; but I do not go to sleep again after I have once awaked of myself, after daylight.—I remain in bed until the feeling of tiredness goes off, if there is any, and I get up when I feel like it, I do not sleep in the day time; it is a pernicious practice, and will diminish the soundness of repose at night. Dr. Holyoke, after he was a hundred years old, said, "I have always taken care to have a full proportion of sleep, which, I suppose, has contributed to my longevity." The want of sufficient sleep is a frequent cause of insanity. To obtain good sleep, the mind should be in a sober, quiet frame for several hours before bedtime. I think people require one hour's more sleep in winter than in summer.—[Hall's Journal of Health.

GUANO IN CUTANEOUS DISEASES.—Remarkable results have followed the use of guano in pemphigus, psoriasis, chronic eczema, and in arresting the excessive suppuration and degeneration of tissues in scorfulous ulcerations.—Solutions of the same substance have radically cured extensive ulcerations of the cornea also lencomas and thick albugos, and the eye has regained its natural transparency. It has also cured tinea. Internal remedies are not to be neglected while the guano is employed externally: give iodine in favus; arsenical preparations in certain severe herpetic affections; iron and iodine in scrofula; mercury and iodide of patassium in syphilis, etc., and purgatives in all cases. From one to four ounces of guano to a pint of water is the proportion for the solution; it must vary according to the inflammatory condition of the affected parts.—Boil the solution and filter.

Mix one drachm of guano, with one ounce of lard, for a very good ointment.

[The Doctors, it seems, not to be behind our farmers in the use of guano, have at last admitted it into their pharmacopœia. We have no doubt but a little stable manure would answer as good a purpose for the long list of ills for which guano is recommended.

SICK HEADACHE.—Half a drop of croton oil every hour until free catharsis is produced.—Three to five doses generally required. headache in the majority of cases is more dependent upon a disordered stomach, in which cases the cure is hastened and the action of the oil facilitated, by the previous administration of an emetic of Ipecacuanha. When the disease is attended with distressing dyspnœa, and it complicated with uterine affections, emetics become almost indispensable.—[Nelson's American Lancet.

CRYSTAL GOLD FOR FILLING TEETH.—The last number of the "Family Dental Journal," published at Albany, N. Y. advocates the superiority of crystaline gold for the filling of teeth. It asserts that it is better than gold foil, or gold in any other state or form for dental purposes.

The crystal gold for this purpose, is the invention of Dr. A. J. Watts, of Utica, N. Y. who has one patent for the same, and has recently made application for another improvement.—The crystal gold, possesses the quality of cohesiveness and malleability, and it accommodates itself, to the inequalities of decayed teeth, like a paste. When pressed with a proper tool into the cavity of a hollow tooth it becomes as perfectly metalic as solid gold. We have seen some of this crystaline gold, and can speak of its good qualities, from personal observation.

LYING IN BED WITH THE HEAD HIGH.—It is often a question amongst people who are unacquainted with the anatomy and physiology of man, whether lying with the head exalted or even with the body, was the most wholesome. Most consulting there own ease on this point, argue in favor of that which they prefer. Now, although many delight in the bolstering up of their heads at night, and sleep soundly without injury, yet we declare it to be a dangerous habit.

The vessels through which the blood passes from the heart to the head, are always lessened in their cavities when the head is resting in bed higher than the body, therefore in all diseases attended with fever, the head should be pretty nearly on a level with the body; and people ought to accustom themselves to sleep thus to avoid danger.—[Medical Journal.

[If this proves any thing, it proves too much, as it affords a good argument for walking on all fours instead of moving erect like a man. Macklin, the celebrated actor and author, lived till he was 99 years of age; he was exceedingly careful of his health, and was very particular about sleeping with his head elevated far above the common standard.

The "Medical Times and Gazette" mentions a case in which delirum appeared to have been induced by forced abstinence from tobacco, and was relieved by its re-employment. Another similar instance was that of a man whose skull had been trepaned on account of fracture, and who subsequently became raving, but, being allowed to-smoke, was soon relieved and rapidly recovered.

Combustibles and Incombustibles.

A combustible body is one which actually burns, such as carbon. An incombustible body is one that does not itself burn. A supporter of combustion is one that does not burn, but gives strength and support to one that does burn, such as oxygen, which supports carbon in producing heat. A common fire exhibits the union of the carbon of the fuel and the oxygen of the air. A gas light exhibits the union of the carbon, hydrogen, and oxygen to produce both heat and light. In neither process is the oxygen burnt, but only the combustibles, carbon and hydrogen. In all ordinary circumstances oxygen is therefore an indispensable element of combustion, and its proper supply a question of the first importance to economy of fuel. For instance, if only 8 parts of oxygen are admitted for each 6 parts of carbon evolved from the fuel, the combustion is very imperfect, and much of the heat of the fuel passes off in combustible gases, of which carbonic oxyd is the chief. If, however, 16 parts of oxygen are admitted to combine with 6 parts of carbon, the combustion is 70 per cent. better than the last, producing steam and carbonic acid as the products of perfect combustion. Under the ordinary pressure of the atmosphere, oxygen is the supporter, and carbon and hydrogen the combustibles, but in a vacuum, or under the intense action of the oxy-hydrogen blast-pipe, this natural order is reversed, and oxygen becomes the combustible and carbon the supporter of combustion.—[J. Sewell, on Steam and Locomotion.

Black Dye For Felt Hats.

The composition of this dye, for which a prize was awarded, in Paris is as follows. 1. The felt hat bodies are first cleaned, and galled by passing them through the following solution, and washing: fustic, copperas, argal, each 8 lbs. are boiled together in water for half an hour. 2. The dye-bath consists of 55 lbs campeachy logwood, 1½ lbs. gum, 3 lbs galls, which are boiled together in water for 3 hours. To produce the black color, 5 lbs. refined verdigris, 2 lbs. each of blue vitriol, sugar and quicklime, are added to the bath.—[Bulletin of the Society for the Encouragement of Art.

[This is a wretched receipt, for which to award a prize.

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TO CORRESPONDENTS.

J. H. C., of Pa.—The snapping noise which you hear when steam is let into cold pipes, is eaused by the expansion of the metal. Glass tumblers and earthenware vessels emit the same sounds when boiling water is poured into them.

T. A. R., of ——.—We did not understand your question about the india rubber balls; they are molded in two sections, then joined together at the edges, by heating them and pressing them together before they are vulcanized.

R. W., of Pa.—Wash your castings after they are treated with acid, in warm water, in which a little soda has been dissolved. You can dissolve the salt of soda in warm water, then pour it into the tub; if the castings are afterwards allowed to remain exposed to the air in a wet state they will still oxydize.

H. S., of Penn.—We do not know any other persons than those you have named, who have machines for making bungs. Isinglass can be dissolved in water.

H Strauch, of Pottsville, Pa., wishes to know where he can purchase a machine for making bungs for casks, &c.

J. S. H., of N. Y.—Direct your letter to the President of the University; he will get it, The cammon gauge in use here is Ashcroft's.

N. K., of N. Y.—Arsenic is the best substance for preserving specimens of birds.

W. H. W., of Tenn.—There is no work that we are acquainted with peculiarly devoted to slide valve engines. Any good work on the steam engine treats on slide valves, especially Clarke's work on Locomotives, which is sold by Blackie & Son, Fulton street. this city.

J. H. B., of Pa.—The liquid gallon, U. S., contains 231 cubic inches. The stand pipe, as we understand it, would neither be a loss nor gain of power.

J. C. B., of Phila.—Parties in this city are desirous of procuring an interest in your invention; we will furnish you with their names on application.

R. J. N., of Geo.—We believe your pencil is patentable. The fee of the Patent Office is $30: we prepare full specifications.

E. B. M., of Ind.—Dip your paper in a weak solution of boiled logwood, and submit it to a stream of steam for a second, and see if it does not restore the writing; it should color the rest of the paper a light gray, but where the writing was it should appear black.

J. M. T., of Pa.—It would be well if the subject to which you allude was more thoroughly investigated; but you know we are devoted to the laws of physics.

J. G., of R. I.—We believe the cast steel is run into the cast-iron in a mold; we do not know any other mode of uniting the two properly together.

F. B., of N. Y.—You can file a caveat for your plan, but it must contain a full description of the improvement: we have little confidence in Ruthven's method. The fee for an American patent is $30. The fees for foreign countries vary from $100 up to $500.

J. D. B., of Phila.—We agree with your remarks.

S. K. L., of N. Y.—Although you have sent us some very useful information, your letter is so long, and the useful somixed with that which is of no use, we cannot afford time to correct and condense it.

E. C, H., of N. H.—We have personally given thesame subject—cotton mixed with woolen yarn—a good deal of attention.

D. A W., of Vt.—H. C. Baird, of Philadelphia, is publisher of the Chemistry of Dyeing. You must dye the cotton last, not first, and then you will be successful.

W. B., of Ct.—We have nothad an opportunity of examining the globes to which you refer, and we did not wish to speak of them until we did so.

H. M., of Ohio—One ounce of copper to one pound of tin are proportions of the metal to which you refer. The greatest square in a circle is the easiest thing in the world to obtain: draw two diagon s through the circle, join their extremities, and you have it. Write to Jarvis Case, of Selma, in your State, and he will give you the proper information on about the pumice rollers.

R. B. B.' of R. I.—All hydraulic rams may be said to be operated by back-water: it requires a well spring with some fall to work a water ram.

W. F., of Mass.—We cannot publish your communications.

W. O., of N. Y.—We would submit the clothes to the action of steam, if they were cotton; the plan we have heard as being best for woolen clothes is to bury them for a few days in earth; steaming, however, is the best plan.

O. M., of Mass.—We will devote a chapter to the subject on some future occasion, and use your balloon.

W. H. H., of N. J.—No advantage could accrue to you from pumping back the water to be used over again. We do not see any novelty in the plan.

W. A., of Ill.—You want a full description of the mode of constructing the telescope. You should get a work on optical instruments, as we have not space at present to give you a proper description.

E. B. Q., of Mass.—There are many water engines now in operation, and are useful for high falls, but we would never recommend them for low falls; a i water-wheel is better. Yours will operate, but we are convinced that much friction must attend its working.

W. B., of Mass.—An elastic diaphragm in the air chamber, to accomplish the same object, has been used, which we think is better than the piston. A patent would be doubtful: we will give the communication attention.

E. J. U., of Pa.—Your idea of forcing water by means of a screw is not a patentable device, and we cannot advise an applciation; we do not discover in the arrangement any advantageous feature not already embraced by other devices for the same purpose.

O. W., of ——.—Your gauge for buzz saws is new, and we think a patent can be secured for it. When you write us again, don't, we entreat of you, omit to inform us where you reside: your letter bears neither date, town, county, nor State, therefore we could not address you by letter.

O. C. C. & Co., of Mass.—Almost the same kind of a machine for scouring knives as the one you describe, is extensively sold in this market: you cannot secure a patent on it.

G. Y., of Md.—Your plan for preventing boiler explosions does not appear to possess any patentable novelty: in Vol. 2 Sci. Am. is illustrated a device embodying the same distinctive features.

A. D. H., of Miss.—Boil your cotton awnings in some bark liquor or sumac, and some alum, then wash them well and dry thoroughly.

C. J. H., of N. Y.—We would choose the narrow deep bucket in preference to the long narrow one.

G. P., of La.—We do not know any substance to remove the lime from your copper pipes, that will not affect iron.

L. B. M., of Ind,—You may rest assured that none of your plans will operate so economically as the common water wheel—over-shot or re-action- You cannot raise water with a ram to work an over-shot wheel. If you can double the effect of the water ram you will be able to secure a patent, if the plan is new. A hydraulic ram cannot raise water out of a dead pool.

T R. B. & Son, of N. Y.—Send us a model anddescription of your bed pin machine, and we will carefully examine it. We are pleased to learn that black varnish receipt proves good.

Money received on account of Patent Office business for the week ending Saturday, March 18:—

T. H. P., of Me., $30; W. C., of N. Y., $30; M. & E., of N. Y., $20; D. D., of N. Y., $20; J. H. S., of Md., $25; G., L., of Pa., $50; E. H., Ill., $30; W. K., of O., $30; N. K. of Pa., $30; J. B. M., of Ga., $30; J. C. D., of N. Y., $30; L. L. P., & Co., of Ct., $30; C. F. P., of Ct., $30; R. M., of N. Y., $30; J. S. P., of Ct., $25; E. W., of N. Y., $30; J. C. B., of Ct., $15; W. Mc., of N, Y., $45; M. C. B., of N. H $15; J. W. McG., of Pa., $50; T. J. H., Jr., of N. Y., $20; E. D. C., of Ct., $20.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, March 18:—

J. H. S., of Md.; J. W. McG., of Pa., (2 cases); R. B. of N. Y.; T. J. H., Jr., of N. Y.; J. S. P., of Ct.; M. C. B., N. H.; D. W., of Mo.; E. D. C., of Ct.; P. R., of N. Y.; E. & H., of Liverpool, Eng, (2 cases.)

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American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express, or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

MUNN & CO., Scientific American Office, 128 Fulton street, New York.

EUROPEAN PATENTS.—MESSRS. MUNN & CO. pay especial attention to the procuring of Patents in foreign countries, and are prepared to secure patents in all nations where Patent Laws exist. We have our own special agents in the chief European cities; this enables us to communicate directly with Patent Departments, and to save much time and expense to applicants.

SUPERIOR MACHINISTS' TOOLS—CARPENTER & PLASS, corner of Hester and Elizabeth sts, and 46 Eldridge, are now finishing a lot of their superior tools, and can furnish, at short notice, lathes of 8, 10, 12, 16, or 21 feet lengths, and swinging from 14 to 26 inches diameter. Also upright Drills, suitable for any size hole less than one foot; also on hand one hand lathe with slide rest and wood shears, 20 feet long, swing 25 inches, nearly new; price $300. Also one patent toggle joint binder's Standing Press, $200; also one upright Engine, 8 inch bore, 14 inch stroke, new and improved style. 1*

TO MANUFACTURERS—To Let, at the South Ferry, Brooklyn, several lofts of unusual size and convenience, with steam power and every facility for manufacturing purposes. They are more than usually well lighted, warmed throughout, and amply provided with gas; a desirable location for almost any manufacturing business. Rent low to a good tenant. Apply to 30 South William street, New York. 1*

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28 4* F. GARDNER, Boston, Mass.

PARTNER WANTED—With $500 or $1000—A celebrated Chemist, formerly Professor of Chemistry in Germany, where he has made many practical inventions, for which a ready market can be obtained in this country, is desirous of associating himself with some gentleman of business habits, for the purpose of establishing a chemical manufactory. References given and required. Address P. BUTZ, Stapleton, Staten Island, or O. ANDREAE & CO., 49 Broadway, N. Y. 1

METALIC LETTERS AND FIGURES—To put on Patterns, Roman style. Size, 5-16, 3 cents; 3-8, 3cts; 1-2, 4cts; 5-8, 4cts; 3-4, 5cts; 1 inch, 6cts; 1 1-4, 7 cts; 1 1-2, 8 cts; 2 inch., 10 cts; they can be sent to all parts of the Union, either by mail or Express, we weigh all packages, and send them the cheapest way: we also manufacture several sizes of Lift and Force Pumps expressly for railroad water stations, mills, &c., a superior and well-finished article, and warranted the best in market. Address, COWING & Co., Seneca Falls, N. Y.
28 1

SUBMARINE ARMOR—Pumps and all necessary apparatus, with improvements on Teba's (London,) and Gowen's (American) Armors and Pumps. One suit of Armor, with a three-cylinder air pump, for sale; has been used sufficiently to prove its utility and safety and ease to the operator. Superior Bank Note or Copperplate Presses always on hand. Transfer Presses and Rolls, with other machines used by engravers; superior machinists' tools; shearing machines for prints, carpets, and other goods; spirals and ledgers furnished for other machines; bonnet and hat presses always on hand; these machines are in general use in this and other cities. Traverse card grinders, buckram molds for tips and bands, made to any shape. The machines enumer ated above are made in the best manner; their reputation can be ascertained by inquiry of parties using them in this and other cities. Address GEO. C. HOWARD, 18th street, below Market, Philadelphia. 28 2*

WROUGHT IRON DIRECT FROM THE Ore—The owners of James Renton's Patent are now prepared to sell rights for this most valuable invention. Apply to JAMES RENTON, Cleveland, Ohio, or to A. H. BROWN, 107 Market st., Newark, N. J. 27 10*

UNITED STATES PATENT OFFICE.
Washington, February 13, 1854

ON THE PETITION of John N. Vrooman, of Niskayauna, New York, praying for the extension of a patent granted to him on the 15th day of April, 4840, for an improvement in floating swing bridges, for seven years from the expi ation of said patent, which takes place on the fifteenth day of April, eighteen hundred and fifty four, (1854)—

It is ordered that the said petition be heard at the Patent Office on Friday, the 14th of April next, at 12 o'clock. M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Pa.; Scientific American, New York; Post, Boston, Massachusetts and Enquirer, Cincinnati, Ohio, once a week for three successive weeks previous to the 14th day of April next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 25 3

SCREW CUTTING MACHINES. with P. W. Gates' Patent Dies—The subscribers keep constantly on hand three sizes of the above-named machines, to wit—No. 1 machine, 10 sets dies and taps from one-half to two inches, $350: No. 2, 8 sets dies and taps, one-half to one and a half inches, $250; No. 3, 6 sets dies and taps, three-eighths to one inch, $150. Cash on delivery at shop. P. W. GATES & CO.
Chicago, Ill. 27 13

HUDSON MACHINE WORKS and Iron Foundry—at Hudson City, N. Y., are prepared to contract for castings for railroads, bridges, buildings, gas pipes and posts, water pipe, cast-iron ornamental floors, cannon, &c. Steam engines and boilers, high and low pressure, sugar mills, Cornish lifting and forcing pumps for mines: stamps, mortars, and mining machinery:—also superior hydraulic pumps and presses, and superior machinists' tools made to order. Especial attention given to the making of patent machines. Orders by mail will receive prompt attention. New York Office No. 18 Exchange Place.
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THE HAND BOOK FOR THE ARTISAN, MECHANIC AND ENGINEER—By the well-known Mechanical author, OLIVER BYRNE, is this day published by T. K. Collins, Jr., No. 8 North Sixth street, Philadelphia, Pa. It will maintain its place among among the other numerous and justly valued works of this author. The work contains the arts of Polishing, Lackering, Grinding, Japanning, Staining, and Burnishing, as well as the arts of perfecting engine works and mechanical designs; the ornamenting of wood, stone, marble, glass, diamonds, iron, steel, and works in all sorts of metals and alloys, and the various abrasive processes that effect what cannot be done by cutting tools. To which is added a dictionary of apparatus, materials, and processes employed in the mechanical and useful arts, for Grinding, Polishing, and Ornamenting. This work contains 483 Pages 8vo., eleven large plates, and 185 wood engravings. Price $5. It will be sent by mail free of postage on receipt of $5. 25 5

BAKER'S IMPROVED BOILER FURNACE—As used at the Crystal Palace: orders received for Stationary, Marine, or Locomotive Furnaces on this plan, and also for the rights for towns, counties, or States: certificates can be shown of furnaces in use for stationary, marine, and locomotive furnaces, with saving from 30 to 50 per cent. in fuel. J. AMORY,
25tf General Agent, 28 State st, Boston, Mass.

J. A. FAY & CO., Worcester, Mass., Builders of Daniel's Planers, with improvements, and Matching Machines with carriage, to joint and match parallel or taper. 25 4*

NORCROSS' ROTARY PLANING MACHINE—It has been affirmed by a decision of the Supreme Court of the U. S. that the Norcross Patent does not infringe the Woodworth machine. Having obtained the above decision in my favor, I now offer to the public my machines and the right to use them. And I have no hesitation in saying that they are much superior to any other planing machine in use. I obtained medals at the Fair in Boston, and at the American Institute in New York, for the best planing in competition with the best Woodworth machines. And now that the question of infringement is settled by the highest authority, the public can have them at a fair price. They are not only the best machines ever invented, but the safest—the life of the operator is not endangered as with other machines, which consideration alone is worth four-fold what I ask for the right to use them.
N. G. NORCROSS.
Lowell, Mass., Feb. 11th, 1854. 24 6*

MATHEMATICAL AND OPTICAL INSTRUMENTS—The subscriber begs leave to bring to the notice of the professional community his new and extensive assortment of the above Instruments, which he partly imported direct from the most celebrated makers in Europe, and partly had manufactured under his own personal supervision. The undersigned would particularly invite attention to his very large and complete assortment of the justly celebrated Swiss Mathematical Drawing Instruments, for the sale of which, in this country, he has the sole agency, and which he can furnish at from $5 to $200 per case. Those Drawing Instruments received the prize medal at the London and New York Exhibitions. Orders from any part of the Union promptly executed, and price list sent if required.
C. T. AMSLER,
21 6eow 224 Chestnut st, Philadelphia, Pa.

MACHINERY.—S. C. HILLS, No. 12 Platt-st., N. Y. dealer in Steam Engines, Boilers, Iron Planers Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Machines; Woodworth's, Daniel's, and Law's Planing Machines; Dick's Presses, Punches, and Shears; Morticing and Tennoning Machines; Belting; Machinery Oil, Beal's Patent Cob and Corn Mills; Burr Mill and Grindstones; Lead and Iron Pipe, &c. Letters, to be noticed, must be post-paid.
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$500 REWARD—For an Invention to Prevent the Alteration of Bank Notes. To Chemists and others. In order to prevent the loss and annoyance occasioned by the ALTERATION of Bank Notes either by changing the name of the Bank, or the denomination of the Bill, as practiced by counterfeiters, and to procure an effectual barrier to such practices, by encouraging the invention of materials, such as ink and paper, of a nature to afford in either or in any combination of them, the desired protection—the Executive Committee of the Association of Banks for the Suppression of Counterfeiting, will pay the sum of Five Hundred Dollars to any person who shall invent the best mode, in the opinion of the Committee, of accomplishing the object named. All plans to be submitted to the undersigned on or before the 25th day of March next, and to be accompanied with such explanations of the materials and processes as the party applying may be willing to disclose. Each applicant to lodge with the Treasurer of the Association, Henry M. Holbrook, Esq., for the term of three months, the sum of one hundred dollars, which shall be paid to any person who shall, during that time, alter, by removing and printing anew, any material portion of a bill or note prepared in accordance with the plan submitted, in such a manner that the alteration would, in the judgment of the Committee, be likely to pass unsuspected. And if, at the end of said three months, no one has been able to effect such alteration, and the Committee are satisfied that the materials proposed will stand all the tests which the present knowledge of chemistry affords, then the hundred dollars will be returned, and the reward paid over to the successful applicant, and the hundred dollars deposited by each of the other applicants to be returned to them respectively. Per order of the Executive Committee,
J. M. GORDON, Secretary.
Columbian Bank, Boston, Mass., Jan 24, 1854. 22 7

NEW HAVEN MANUFACTURING COMPANY—New Haven, Conn., (successors to Scranton & Parshley) have on hand Power Planers, to plane from 3 to 12 feet; slide lathes from 6 to 18 feet long; 3 sizes of hand lathes, with and without shears; and counter shafts: universal chucks; drill presses, index plates, bolt cutters, and slide rests. The N H. M. Company also have the right for Harrison's patent Flour and Grist Mill for the term of five years, and are prepared to furnish these superior mills at short notice. They are unequalled by any other mill, and will grind from 20 to 30 bushels per hour, and will run without heating, being self-cooling. They weigh about 1400 lbs., are of the best French burr stone, 30 inches in diameter; are snugly packed in a cast-iron frame, price of mill $200, packing $5. For cuts, prices, and further particulars apply post-paid, as above, or to S. C. HILLS, agent N. H. M. Co., 12 Platt st., N. Y. 22tf

PORTABLE STEAM ENGINES—GEORGE VAIL & CO., Speedwell Iron Works, Morristown, N. J., LOGAN VAIL & CO, No. 9 Gold st, N. Y., are prepared to furnish Portable Steam Engines from four to eight horse power, with locomotive boilers. These engines are recommended for their simplicity, durability, and economy, being made from the best materials and designed for practical use. They are placed on wheels convenient to be moved from place to place, and are shipped in working order: for plantation use, machinists, or others wanting small power, these engines will be found superior to any others in use. A Silver Medal was awarded at the late Fair of the American Institute, and a premium in cash of $100 at the Maryland State Fair, held at Baltimore in October last. Persons writing us by mail will be particular to give their address in full.
21 38*

JOHN PARSHLEY, No. 5 and 7 Howard st., New Haven, Ct., manufacturer of Machinists' Tools, and Steam Engines, has now finishing off 25 Engine Lathes, 6 feet shears, 4 feet between centers, 15 inches swing, and weighs about 1100 lbs. These Lathes have back and screw gear, jib rest, with screw feed, and the rest is so arranged that the tool can be adjusted to any point the work may require, without unfastening the tool, hence they possess all the good qualities of the jib and the weight lathes: they are of the best workmanship. Price of Lathe with count shaft and pulleys, $155 cash. Cuts, with full description of the lathe, can be had by addressing as above, post paid. Also four 30 horse power vertical Steam Engines with two cylinders. Price of engine with pump and heater, $800 cash. For particulars address as above. 19tf

C. B. HUTCHINSON'S PATENT STAVE Cutting Machines—The best in use, and applicable alike to thick and thin staves, for barrels, hogsheads, &c.; also his Head Cutting and Turning, and Stave Jointing and Crozing Machines. This machinery reduces the expense of manufacturing at least fifty per cent. For machines or territorial rights, apply to C. B. HUTCHINSON & CO., Syracuse, N. Y. 27tf

ENGINEERING.—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic, Self-adjusting Conical Packing, Faber's Water Gauge, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc., etc.
CHARLES W. COPELAND,
20 tf Consulting Engineer, 64 Broadway.

PLANING, TONGUING, AND GROOVING—BEARDSLEE'S PATENT.—Practical operation of these Machines throughout every portion of the United States, in working all kinds of wood, has proved them to be superior to any and all others. The work they produce cannot be equalled by the hand plane. They work from 100 to 200 feet, lineal measure, per minute. One machine has planed over twenty millions of feet during the last two years, another more than twelve millions of feet Spruce flooring in ten months. Working models can be seen at the Crystal Palace, where further information can be obtained, or of the patentee at Albany, N. Y
27tf GEO. W. BEARDSLEE.

MINING MACHINERY—Of most approved construction, furnished by FRED'K COOK & CO, Hudson Machine Works, Hudson, N. Y. 15 6m

SHINGLE MACHINES—Wood's patented improvement in Shingle Machines, is unquestionably the best ever offered to the public. The undersigned is now at the West, offering rights in this machine for sale. It is a rare opportunity for a safe and profitable investment in a machine without a rival, for the purpose to which it is applied. Parties wishing to correspond with me can do so by addressing J. D. JOHNSON,
21tf Bridgeport, Ct.

A. B. ELY, Counsellor at Law, 52 Washington street, Boston, will give particular attention to Patent Cases, Refers to Messrs Munn & Co., Scientific American.
16 1y*

LEONARD'S MACHINERY DEPOT, 109, Pearl st., and 60 Beaver, N. Y.—Leather Banding Manufactory, N. Y.—Machinist's Tools, a large assortment from the "Lowell Machine Shop," and other celebrated makers. Also, a general supply of mechanics' and manufacturers' articles, and a superior quality of oak-tanned Leather Belting. P. A. LEONARD.
1tf

McALLISTER & BROTHER.—Opticians and dealers in mathematical and optical instruments, No. 48 Chesnut st., Philadelphia, Pa.—at the old stand established in 1796 by John McAllister, Senr, Mathematical instruments separate and in cases, Tape Measures, Spectacles, Spy Glasses, Microscopes, Thermometers, Salometers, Hydrometers, Magic Lanterns, &c., &c. Our illustrated and priced catalogue are furnished on application, and will be sent by mail free of charge. 10 25*

NORRIS WORKS, Norristown, Pa. The subscribers build and send to any part of the United States, Pumping, Hoisting, Stamping, and Portable Engines, and Mining Machinery of every description.
41 1y.* THOMAS, CORSON & WEST.

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Scientific Museum.

Influence of Pressure upon the Formation of Chemical Compounds.

Hydrate of chlorine, which is immediately decomposed at ordinary temperatures and at the pressure of the atmosphere, remains for the most part undecomposed even at a summer heat when inclosed in hermetrically-sealed tubes, under the pressure of the chlorine which is set free from a portion of it which undergoes decomposition. In such a tube, when plunged into water of a temperature of 86°–104° Fah., the hydrate of chlorine is decomposed, but becomes partially restored on its return to the ordinary temperatures.

This decomposition is not prevented by the exclusion of the air under the pressure of chlorine gas of the tension of the atmosphere; under these circumstances the decomposition takes place as usual at any temperature above 32° Fah.

A tube in which hydrate of chlorine was hermetrically sealed was exposed to the sun for a whole summer's day. It became fluid, but did not indicate decomposition of the water by the setting free of oxygen.

The author had already observed, that during the preparation of liquid sulphuretted hydrogen from sulphuret of hydrogen in hermetrically-sealed tubes, colorless crystals are sometimes formed, which immediately disappear on the tube being opened.

In two tubes, in which sulphur, but no liquid sulphuretted hydrogen had separated, these crystals were found in large quantity; they did not however make their appearance in a third tube, in which the persulphuret of hydrogen was enclosed together with concentrated muriatic acid. Hence the author concludes, that the crystalline compound, which is no doubt a hydrate of sulphuretted hydrogen, must be produced when a small quantity of water is inclosed with hydrate free from acid; the water then combines with the sulphuretted hydrogen under the pressure of the condensing sulphuretted hydrogen (17 atmospheres). Under this pressure it is permanent at ordinary temperatures. If the tube be heated in water to 86° Fah., the compound dissolves, and rapidly becomes fluid, returning to a solid state again on being cooled to the ordinary temperature.—[Prof. Wohler Ann. der Chem. und Pharm.

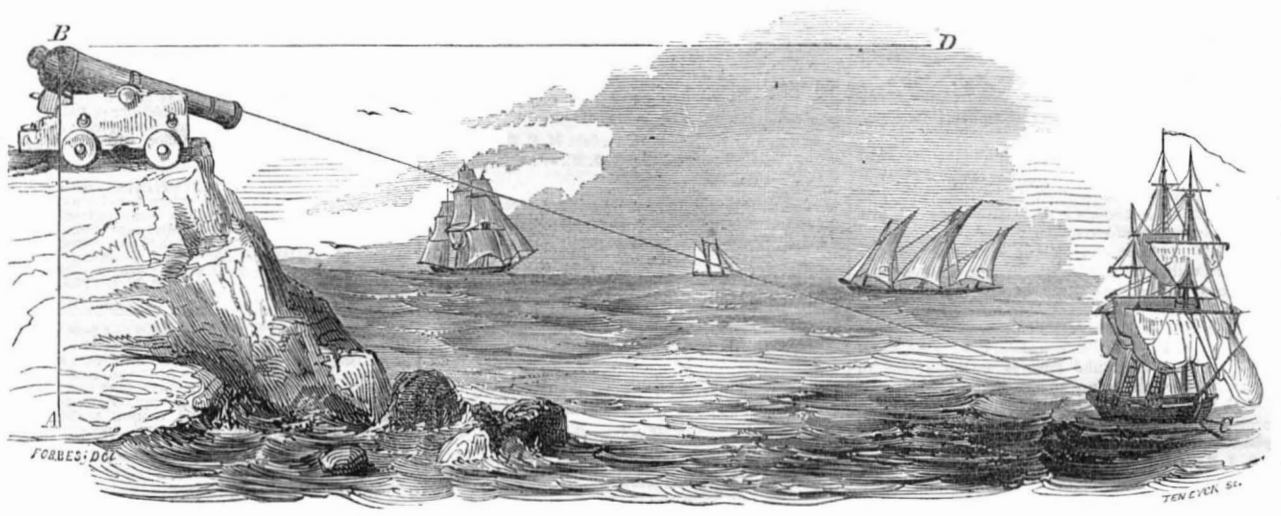
National Hand-Writing.

At a recent sitting of the Paris Academy of Science, some papers were read relative to hand-writing. Among the facts stated, the most remarkable was, that no man can ever get rid of the style of hand-writing peculiar to his nation. If he be English, he always writes in English style; if French, in the French style; if German, Italian or Spanish, in the style peculiar to his nation. I am acquainted with a Frenchman who had passed all his life in England, and who is English in dress, habits, tastes, every thing, who speaks English like one of our countrymen, and writes English with ten times more correctness than ninety-nine in the hundred of us, but who cannot for the life of him, imitate our mode of writing. I have also heard speak of an English youth, who was carefully educated in this country, and for eighteen years of his life mixed exclusively with French writing-masters, and perhaps never saw any thing but French writing in his life, but who always wrote in the same style as we all do; it was really national instinct. In Paris all the writing-masters profess to teach the English manner of writing, but with all their exertions they can never get their pupils to adopt any but the cramped hand of the French. Some person pretended that he could tell the character of individuals from their hand-writings. I know not whether he spoke truth or not, but assuredly he might have asserted, with the most perfect confidence, that he could distinguish a man's country by his handwriting. The difference between our writing and that of the French is immense—a school boy would distinguish it at a glance. Mix together a hundred sheets of manuscript written by a hundred of our own countrymen, and no one would fail to say which was the British and which was the French, even though they should all be written in the same language and with the same pens, ink, and paper. The difference between Italian and Spanish and German styles of writing is equally as great.—[Edinburg Review.

[For the Scientific American.]

Measuring Inaccessible Distances by Inspection.

I perceive in your number for the 11th February, a method proposed for measuring inaccessible distances. I am induced to forward you the following plan, which I proposed to be followed in large fortifications, some twenty-five years ago for determining with little more than inspection, the distances of objects on the horizontal plane, from any fortified position on an eminence. The principles upon which my plan was adopted are of course found in Geometry and Trigonometry. I only allude to their adaptation to the construction of tables, necessary to be calculated and kept in each battery for inspection.



Let B be the position of a gun on an eminence, whose hight B A above the level of the sea is known, C the position of a ship or other object on the horizontal plane; suppose B D to be drawn parallel to A C. Lay the gun by the line of metal for the object at C, and with a quadrant determine the angle of depression D B C, which will be the measure of B C A, the alternate angle. Now in the right-angle triangle A B C, we have three quantities given to find all the rest. Then as the sine of A C B is to A B, so is radius to B C the inaccessible distance. Thus we obtain a common formula, namely, that the hight of the piece above the horizontal plane divided by the sine of the angle of depression will in all cases give the distance of the inaccessible object from the gun.

Being quartered in the garrison of Gibraltar for some years, where batteries are to be found at various elevations from the horizontal plane to the rock mortar, which is about 1,296 feet above the sea, I proposed to calculate and construct tables for every battery on the foregoing data, as follows:—

Take a card in the form of a rectangle, and on the top horizontal line place all the angles within the capabilities of the piece, and on the left hand vertical side, place the several hights of the batteries, then draw cross lines, and under each angle and opposite each hight, insert at the intersection the calculated ranges. Thus when you lay the gun for an object, and find the angle of depression, all that is necessary to do is to look down the column under the angle found, and opposite the corresponding hight of the battery already known, and the distance will be found in yards. Alexander Alcock.

On Re-Vaccination—by Dr. Benedict.

A peculiarity in my own person, perhaps not remarkably uncommon in others, has led me to attentive thought and careful observation on this subject. I remember to have been vaccinated in childhood several times, before the presence of the virus manifested itself by the formation of a pustule. It did at length happen, and the cicatrix still remains. While at college, a few cases of variola and varioloid appearing among the students, I was again vaccinnated, under the impression, that, as seven and even fourteen years had elapsed, I might now be subject to smallpox if exposed. Here again I received the infection, and had a postule larger, and so far as memory serves me in regard to the first, more intense than that.—About four weeks from the time of re-vaccination, and after my arm had entirely recovered from its effect, I again vaccinated myself with lymph taken from the arm of a fellow student. Again, and so soon after the second vaccination, I had a large postule, which went through a regular course, the scab adhering until about the twelfth day. Now here, after the re-vaccination, I would have been considered as safe as the vaccine disease could render me, and doubtless, had I suffered from variola, my case would have been set down as one of those in which vaccination had availed nothing. And yet was there any reason why I should not have suffered the full force of the disease, had I been exposed? Since that time I have repeatedly inserted the virus in different situations, with no other effect than the slight irritation which is known to follow the scratch of the lancet charged with the poison in those thoroughly vaccinated. My own experience has been partly confirmed by observation. I have re-vaccinated many children, and quite a number of those in whom I have watched the progress of the first pustule. I have seen the re-vaccination unequivocally successful in only eight cases, and in no instance have I been satisfied that true vaccinia was present the third time. Re-vaccination of adults has been successful in about the same proportion as in children.

My observations have not been sufficiently extensive to establish any new fact, but I make them known that others may observe also, and see if they do not confirm the following proposition:—

That vaccination, properly performed, and repeated until the susceptibility to the vaccine disease is exhausted from the system, affords entire immunity from the variolous disease.

It may seem that, by including so much, my proposition is worthless, as it would extinguish not only the genuine disease, but its modification, varioloid. But we are to bear in mind that one, two or three successive pustules may still leave the system unprotected, at least in part. Vaccination should be repeated until nothing like a pustule can be obtained. Let each one observe himself, until evidence accumulates which shall sustain or overthrow the position; and let no one say that vaccination is not a protection for those in whom the susceptibility to variola is unusually strong, until they first ascertain whether there is not still left some susceptibility to vaccinia.—[New York Journal of Medicine.

General Diffusion of Gold.—Since the discovery of gold in California and Australlia has turned the attention of people in the direction of the noble metal, its presence has been discovered in many localities where people little dreamed of its existence. Dr. Percy, of the Museum of practical geology, London, has been, during the past year, devoting himself to an examination of lead, lead ores, and lead compounds, with the object of discovering the presence in all these of gold. Universally gold has been discovered in every specimen hitherto examined by Dr. Percy. In fact he states that hitherto he has been unable to meet with lead, or compounds of lead, altogether free from gold. His experiments have been attended with the result of extracting gold from all these bodies in a visible form; therefore its existence is not a matter of chemical hypothesis. Perhaps the most curious circumstances in connection with Dr. Percy's discovery is this—even soluble lead compounds are auriferious, though by what solvent the gold is held in solution it would be impossible to say. Finally, Dr. Percy hazards the speculation, that hereafter gold may possibly be discovered as an universal constituent of sea water.

LITERARY NOTICES.

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